1 August 2008

DEFENSE CONTRACTORS SBIR/STTR PARTNERING MANUAL

Small Business Innovation Research / Small Business Technology Transfer

A Primer on Technology Risk Management and Partnering Strategies

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Foreword

1 August 2008

Defense Industry Colleagues,

As the world looks increasingly to technology innovation to meet the challenges of defense, security, disaster relief and increased health, many in industry have come to identify this nation's SBIR/STTR programs as a unique resource to be mined and supported. While this may not have been true during the SBIR/STTR adolescence of the 1990s, we in government realized by 1998 that small business/large business partnerships required nurturing for SBIR/STTR technologies to transition successfully into defense Programs of Record—that is, to be "commercialized"—and that such partnerships needed a strong "technology pull" from command customers and the acquisition community.

This decade has witnessed a notable exploration of the small business innovation well, by both government and industry, as we have together experimented with SBIR/STTR access strategies and tactics. Congress, having seen the first fruits of our work in a modest but valuable array of products on the battlefield, in the operating room, and in other life-centric venues, has encouraged more and better from the SBIR/STTR resource, and should reauthorize SBIR/STTR in 2008.

To more effectively mine the SBIR/STTR programs, we have learned, requires superior technology risk management, a flexible approach to incentivization, a keen understanding of SBIR/STTR legal and contractual imperatives, and a relentless determination to leverage other fiscal resources to mature technology solutions to platform, system and subsystem problems. This manual is a preliminary assistance effort, in that regard, written with industry business models very much in mind.

As Director of the Navy SBIR/STTR Programs, I am always ready to celebrate our achievements—but I am also quick to say that Navy can, and will, do better. However, the federal SBIR/STTR community of which we are just one part has many and diverse resources. Therefore, we have made an effort in this manual to acknowledge this diversity.

Finally, I welcome your comments on how we can improve this manual, and our working relationships with the nation's extraordinary small business community.

Respectfully,

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Table of Contents

1.0	**Introduction | Overview of Content**	**1**
1.1	Background	1
1.2	Problem	1
1.3	Solution	1
1.4	User Guide to this Manual	2
1.5	Best Practices Strategy for SBIR/STTR Partnering	4
1.6	Frequently Asked Questions	12
2.0	**SBIR/STTR Law and Policy | Review of Salient Documents**	**13**
2.1	Core legislation, SBA Final Policy Directive on SBIR	13
2.2	SBIR and STTR Contrasted	15
2.3	Commercialization Pilot Program	15
2.4	FAR and DFARS on SBIR/STTR Data Rights	17
2.5	SBA Final Policy Directive on SBIR/STTR Data Rights	19
2.6	Core DoD and DoD Agency Policies, Directives and Memoranda	19
2.7	DoD 5000.2 and Defense Acquisition Guide (DAG)	19
2.8	Major Reports and Studies: National Research Council, RAND Corp.	21
3.0	**SBIR/STTR Topic Development**	**21**
3.1	Topic Development and the Approval Process	23
3.2	Proposing Optimal Topics	24
4.0	**Phase I Partnerships**	**26**
4.1	Pre-award SBIR/STTR proposal support (letters, etc.)	26
4.2	Phase I Subcontracts	29
4.3	Transition Planning	30
4.4	Leveraging State, Regional Funds	31
5.0	**Phase II Partnerships**	**32**
5.1	Phase II Proposal Review Input	32
5.2	Phase II Subcontracts	33
5.3	Transition/Insertion Planning and Technology Roadmap Sharing	33
5.4	Transition Assistance Programs	34
5.5	Transition Tools (quads, etc.)	35
5.6	Technology Maturation Funding Sources	36
5.7	SBIR/STTR Partnership Metrics, Recordation and Reporting	39
5.8	Leveraging State, Regional Funds	39

6.0	**Phase III Activities**	**40**
6.1	Small Firm Capability Assessment (risk mitigation), Available Assessment Tools	41
6.2	JCTD, DACP, TTI & Other Federal, State, Regional Funding Sources	44
6.3	Phase III Partnering Vehicles	46
6.4	Common Phase III Obstacles	47
7.0	**Understanding Readiness Levels**	**49**
7.1	Technology Readiness Level - TRL	50
7.2	Manufacturing Readiness Level - MRL	53
7.3	Transition Commitment Level - TCL	56
7.4	Other Process Improvement Tools	57
7.5	SBIR Roadmap With All Readiness Level Tools	59
8.0	**Searching SBIR/STTR Inventories**	**60**
8.1	Dod Agency SBIR/STTR Agency Public Database Comparison	61
8.2	Searching the Navy SBIR/STTR Database – Special Features	61
8.3	Other Federal and Commercial SBIR/STTR Search Products	62
9.0	**Commercialization Pilot Program**	**64**
9.1	Baseline Legislation and Policy	64
9.2	DoD Agency CPPs Compared: A Structure and Functions Summary	65
10.0	**SBIR/STTR Marketing by Large Firms**	**68**
10.1	Federal Marketing To Obtain Phase III Funding	68
10.2	Industry Marketing For Additional Investment, License or Sale	69
11.0	**Dispute Resolution**	**69**
11.1	SBIR/STTR Dispute Resolution Strategies and Resources	69
12.0	**Key SBIR/STTR Points of Contact**	**72**
12.1	Navy-wide and SYSCOM SBIR/STTR Program Managers	72
12.2	Navy SBIR Commercialization Pilot Program Managers	75
12.3	Navy SBIR/STTR Staff and Liaisons – Acquisition Program Offices	75

Table of Figures

Figure 1	SBIR "Pipeline"	6
Figure 2	SBIR Balanced Scorecard	7
Figure 3	Strategic Alignment & Synchronization	9
Figure 4	Unpredictability of Technology Development	11
Figure 5	Right Topic	22
Figure 6	SBIR Contributions Across Defense Acquisition Program	28
Figure 7	Investments Targets	38
Figure 8	Mature and Relevant Technology	41
Figure 9	Supplier Maturity	43
Figure 10	JCTD Framework	45
Figure 11	Measuring Technology Maturity	Technology Readiness Levels	50
Figure 12	TRL Scale Developed by U.S. Army TACOM	51
Figure 13	TRL Scale by DoD Budget Activity Level	51
Figure 14	Manufacturing Readiness Level Tool	53
Figure 15	Defense Acquisition Life Cycle Framework	56
Figure 16	Transition Commitment Level (TCL)	57
Figure 17	Capability Maturity Levels (CMLs)	58
Figure 18	Readiness Level Tools	59

1.1 Background

As the world looks increasingly to technology innovation to meet the challenges of defense, security, disaster relief and increased health, many in industry have come to identify this nation's Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs as a unique resource to be mined and supported. In turn, the Congress, having seen the fruits of these programs in a modest but valuable array of products on the battlefield, and in the operating room, has encouraged more and better use of the SBIR/STTR resource.

This decade has witnessed a notable exploration of this resource, by both government and industry, which together have experimented with SBIR/STTR access strategies. Department of Defense (DoD) programs provide a strong "technology pull" and partnerships between large businesses and small businesses that are the key to the successful transition of SBIR/STTR technologies into DoD Programs of Record (PoR).

1.2 Problem

Both DoD and industry are challenged to deliver mature, quality technologies on time and at reasonable cost. Risk factors are daunting. Although SBIR/STTR can help mitigate technical risk, and large/small business partnerships can achieve risk reduction by increasing the maturity SBIR/STTR technologies, practice shows that such partnerships rarely result in actual insertion of the SBIR/STTR technology. All parties agree that such partnerships are a work-in-progress and better processes are needed to increase success.

1.3 Solution

Our response to large defense industry firms is the *Defense Contractors SBIR/STTR Partnering Manual.*[1] Its goal is to facilitate small/large business partnering, reduce technology transition risks, and improve timely and cost-effective technology insertions in Navy and DoD programs. This manual, written with industry business models in mind and based on extensive interviews, offers a tool suite for strengthening internal SBIR/STTR efforts. In addition to information about the SBIR/STTR programs themselves and about the transition process, the manual identifies a "best practices strategy" for building effective SBIR/STTR partnerships.

1 | A Defense Agency SBIR/STTR Partnering Manual will be available in 2008 as a companion document.

Our primary goal in preparing this manual is to improve industry return on investment in SBIR/STTR technologies by both increasing and streamlining the transition of these technologies to military systems. Secondarily, we hope to encourage use of these partnerships to identify new applications and products for increased DoD sales.

1.4 User Guide to this Manual

The *Defense Contractors SBIR/STTR Partnering Manual* is organized into eleven sections (Section 2–12, below) that profile specific resources, processes or opportunities that defense industry veterans have repeatedly checked through interviews and surveys as needing clarification. Generally speaking, these eleven sections will help large defense industry firms appraise the right level of SBIR/STTR effort in four areas of established concern:

- Understanding SBIR/STTR program mechanics
- Aligning the SBIR/STTR resource with your structure
- Identifying high-value SBIR/STTR technologies and firms
- Managing and assessing SBIR/STTR partnerships for optimal results

Each of the eleven substantive sections is intended to be self-contained, so that a defense contractor seeking information on a particular aspect of partnering can go directly to the relevant section. The sections are summarized as follows:

Section 2: SBIR/STTR Law and Policy

This section identifies, briefly describes and provides links to salient federal laws and directives, Dept. of Defense documents and major independent studies.

Section 3: SBIR/STTR Topic Development

This section briefly describes the topic development process, opportunities and best practices for defense contractors, and general timelines.

Section 4: Phase I Partnerships

This section describes Phase I milestones and timelines, identifies defense contractor opportunities and benefits (including transition planning), identifies state and regional support funding for Phase I activity, and cites project tracking needs.

Section 5: Phase II Partnerships

This section describes Phase II milestones and timelines, identifies defense contractor opportunities and benefits, cites transition planning roles and planning assistance, describes subcontract opportunities, and cites project tracking requirements.

Section 6: Phase III Activities

This section reviews the breadth and variety of Phase III opportunity, availability of complementary federal funding, and describes common transition obstacles encountered by SBIR/STTR projects.

Section 7: Understanding Readiness Levels

This section describes the readiness levels now commonly used (TRL and MRL) in DoD, with links to current definitions, and reviews newer readiness levels more selectively used (TCL, for example).

Section 8: Searching SBIR/STTR Inventories

This section is focused on helping defense contractors mine DoD and DoD agency SBIR/STTR databases and understand the breadth and depth of data resident in these databases.

Section 9: Commercialization Pilot Program (CPP)

This section describes CPP authorizing legislation and subsequent interpretations by DoD Office of the Undersecretary for Acquisition, Technology & Logistics. It also includes a discussion of defense contractor opportunities as well as defense contractor reporting requirements.

Section 10: SBIR/STTR Marketing by Large Firms

This section describes influencing strategies and relating marketing of SBIR/STTR partnering effort by defense contractors to obtain Phase III funding and/or additional customer opportunities.

Section 11: Dispute Resolution

This section identifies typical dispute scenarios that arise in SBIR/STTR partnering work, and presents resolution strategies and resources for these strategies.

Section 12: Key SBIR/STTR Points of Contact

This section provides a directory of principal DoD and DoD agency SBIR/STTR points of contact (POC), inclusive of POCs from relevant non-DoD SBIR programs.

1.5 Best Practices Strategy for SBIR/STTR Partnering

Not addressed in these eleven sections is an overview of SBIR/STTR partnering from an industry strategic perspective. The following seven-step strategy describes an SBIR/STTR partnering approach derived from rigorous interviews and surveys conducted among some of the most experienced technology development hands in the defense industry. The strategy also reflects the experience of successful large/small firm partnering.[2]

In 1998, DoD Acquisition Program Managers were directed to become more involved in their SBIR/STTR Programs. An emergent "best practice" was inclusion by Program Managers of their opposite numbers from industry early in the SBIR/STTR planning process. Just as all government agencies and their Program Managers have varying SBIR/STTR processes that work for them, large firms should develop SBIR/STTR processes that work in their organizations, according to established business models and systems practices.

The following SBIR/STTR investment strategy is not about defining a specific process, but rather is a compilation of characteristics to consider when developing an internal SBIR/STTR process that will work for your organization. In fact, the failure to develop such a process is not an option, for there is little evidence that waiting for small firms to knock on your door holding the perfect technology ready for insertion is a high-value strategy. Finally, large firms should be aware that DoD SBIR/STTR Program Managers are keenly aware of the need to better incentivize large firms to partner, and are seeking solutions.

1 Step One: Build on What You Have

The first step in devising an SBIR/STTR process starts with the identification and assessment of your firm's current organizational opportunities for technology development, for example:

- Your **IRAD** planning process – Does it identify near and far term capability gaps that are not currently funded or staffed?

2 | The Navy SBIR newsletter, *Transitions*, captures partnership examples as a regular feature of the publication, which is available at navysbir.com.

- Your **Rapid Response** group – Does it source external technology inventories to find adaptive technologies?
- Your **DoD program offices** – Do they have Technology Insertion Plans that identify prime/integrator supplier needs?
- Your **Strategic Sourcing** group – Is its tasking inconclusive of technology needs?
- Your **Diversity Management** or **Small Business offices** – Do they play any role in sourcing technologies?

Such an identification and assessment process should lead to a robust business case for incorporating SBIR/STTR technologies in your product lines. This business case would include investment decisions regarding staff and dollars, and the location in your organization where SBIR/STTR activity would reside, so as to complement current component approaches. A key to this first step is acknowledgement of the 2008 DoD acquisition directives regarding the urgent primacy of technology cost-savings and on-time delivery, and of SBIR/STTR as a valuable external resource that can leverage waning internal industry resources.

The premise for your robust business case is that a well-defined transition plan for SBIR/STTR projects is developed as early as possible, with government and contractor assistance. Additional assurance of high-value SBIR/STTR projects can be attained if small firms are selectively included in large firm IRAD discussions, in this regard.

Step Two: Ensure that SBIR/STTR Partnering is Flexible, Agile, Efficient

2

Just as innovation and agility are key strengths of SBIR/STTR firms, lean and agile management of technology development by large firms can be expedited through SBIR/STTR partnering. DoD and DoD agency SBIR/STTR databases, for example, are well-organized, deep and very accessible; thus, your mining of the SBIR resource doesn't require you to develop your own duplicative database. Moreover, risk can be realistically assessed before your SBIR/STTR partnerships are formalized, by using information in these SBIR/STTR databases.

Conversely, most defense contractors share with the Government significant rigor in their planning processes. The tension between this rigor and the need for lean management can create obstacles to SBIR/STTR partnering. Best practices recommend a management strategy agile enough

Figure 1 ▸ SBIR "Pipeline"

Assured transition from "Innovative Idea" to "High Impact Outcome" requires alignment with future capability gaps

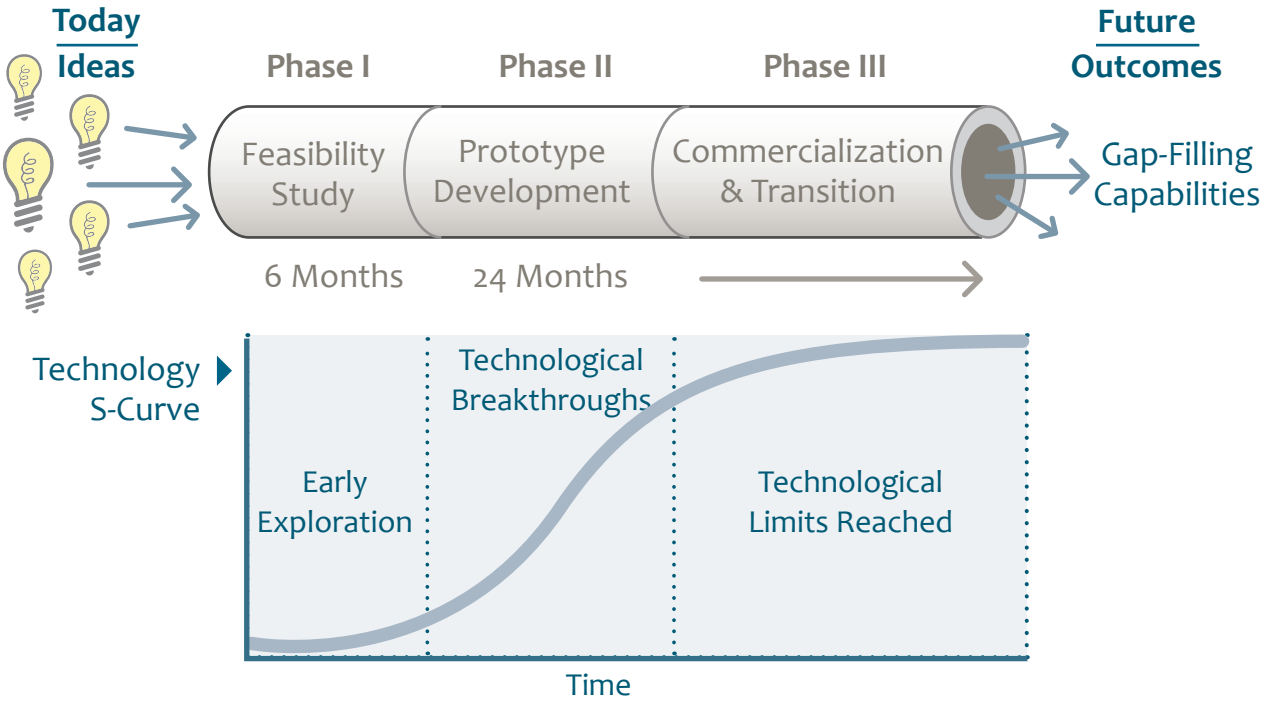


Figure 1 ▸ Depiction of the SBIR development process as a function of timeline, process milestones and technology lifespan.

to support the innovative strength and flexibility of the SBIR/STTR firm, but systematic enough to track and monitor SBIR/STTR partnering. That is, a formal system is needed to anticipate unacceptable risks with specific projects, thus supporting your systems management processes.

3 Step Three: Establish Metrics, Manage What You Measure

Metrics drive behavior—more complete transition metrics lead to a better ability to assess risk and assure that technology maturation is on track. However, the R&D horizon preceding Milestone B of the Defense Acquisition Framework can be up to 10 years. Therefore, the key is to develop and implement metrics that are sufficient but not excessive—and to ensure that such metrics and tracking are integrated into your current technology tracking system.

4 Step Four: Support Your SBIR/STTR Initiative with Current Staff Resources

The business segment tasked with managing your SBIR/STTR partnering activity should integrate partnership work into an established technology development process or system. It should never be ad hoc activity, because

Figure 2 ▸ SBIR Balanced Scorecard

Alignment and visibility of SBIR "Topic Portfolio" using a Balanced Scorecard approach ensures smart technology investments

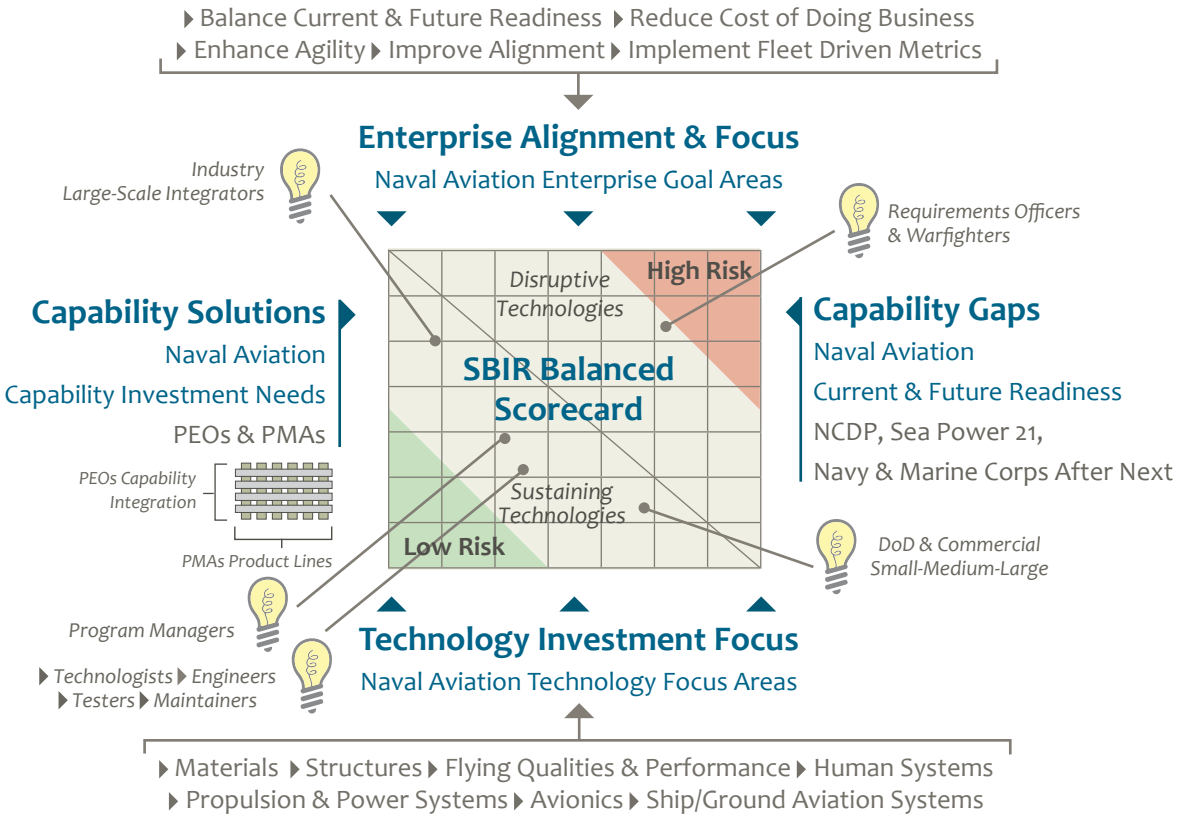


Figure 2 ▸ A government (Naval Aviation Enterprise) application of the familiar "Balanced Scorecard" risk management tool depicts how the technology investment focus bridges the gap between capability needs and solutions, in accordance with an overall technology alignment across programs. Appropriate metrics may be derived from this approach.

that increases risk of transition failure—but neither do you need a new layer of bureaucracy.

Optimally, your firm will identify a central POC for SBIR/STTR activity, a "traffic cop" who directs communication between the large firm, the small firm, and SBIR/STTR agency programs. The "traffic cop" could be a management intern—a method of vetting your future program managers and helping them to know their government customer. For initial partnering discussions with small firms, it is recommended that a standard overview be developed and that key corporate stakeholders meet with the small firm. A corporate internal SBIR/STTR training process and manual should be generated to ensure you have one SBIR/STTR process within your organization.

It's important to address both project level and program level management needs, assigning managers to individual SBIR/STTR projects who will record partnership data so that this information can be rolled up to the program level, where a senior executive can monitor the health of SBIR/STTR partnering activity across a number of projects. The expectations for

project level SBIR/STTR managers should be clearly delineated and, most desirably, become a part of their performance reviews. Carefully chosen contractors can support this work, with cost savings potential.

Tracking SBIR/STTR activity is important, both at the project level and at the program level—a carefully chosen contractor could help support this activity, with cost savings potential. Likewise, your Small Business Office can be useful for goal reporting and including additional fields in their database to capture SBIR/STTR activity. Remember, your government customers are interested in your ability to report on the full range of SBIR/STTR work, especially including Phase III financial data and evidence of transition, up to and including, system/sub-system insertion.

5 Step Five: Participate in SBIR/STTR Topic Development

Because the nation's defense platforms and weapons systems are industry-built, DoD SBIR/STTR programs are turning to industry to participate in the development of topics. Once near and far term program capability gaps are identified and prioritized, these gaps can translate into proposed SBIR/STTR topics. Your participation in topic development should be seen as a key component of your SBIR/STTR investment strategy. A SBIR/STTR topic must:

- Identify an important technological gap (in a program of record)
- Solicit an innovative approach
- Entail research and development
- Not dictate the solution
- Be broad enough to assure multiple applicants

A representative from an SBIR/STTR Office can assist with topic development, and where to find publication of relevant notices, as can a carefully chosen contractor. Remember: because DoD SBIR topics are recommended and endorsed by PEOs, this is an important way of getting closer to your customer.

A poorly understood benefit of SBIR/STTR partnering is that it can help you better understand your DoD customer. Why? Because most SBIR/STTR topics come from acquisition program offices, referencing needs in key Programs of Record that are specified in PEO-level technology roadmaps for PoR blocks. Keep in mind that PEOs vary regarding topic focus, with some PEOs prepared to support topics generating a more mature Phase I result that is closer to a prototype.

Figure 3 ▸ Strategic Alignment & Synchronization

The PEOs and PMAs play critical roles throughout the SBIR process enabling integration and synchronization of technology investments with future capability and product-line roadmaps

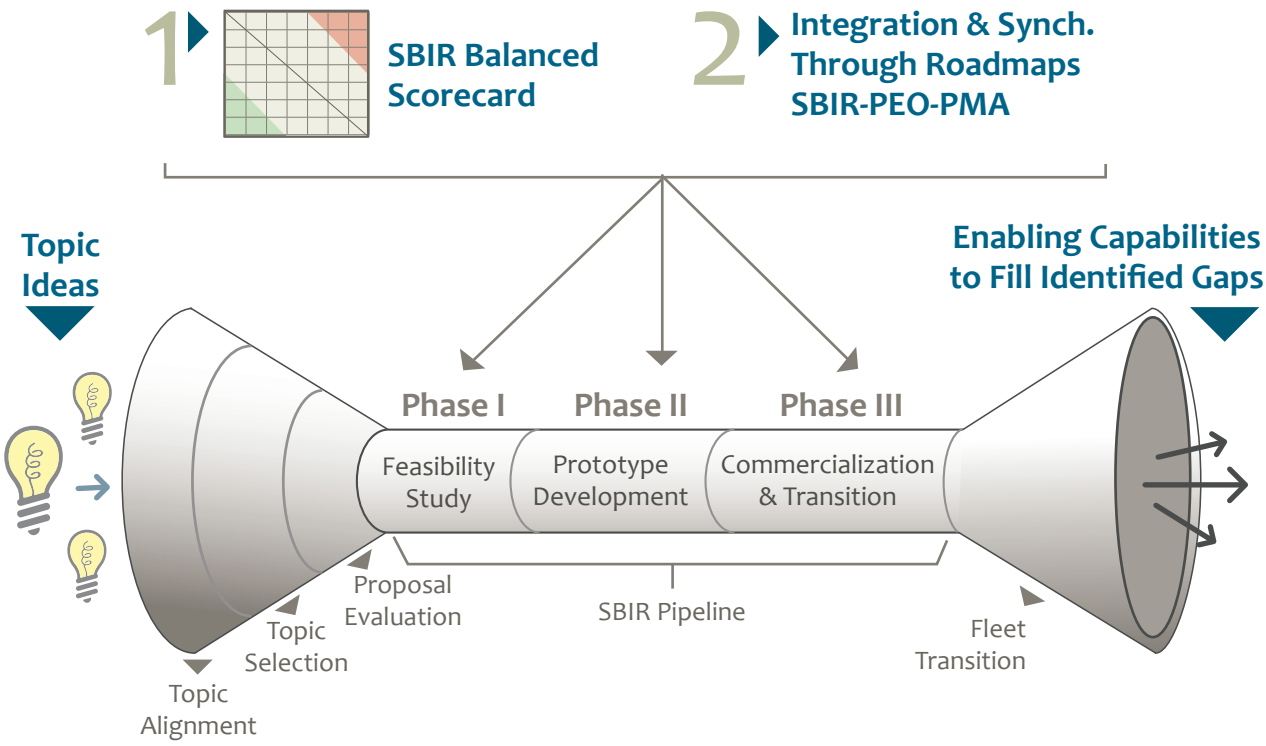


Figure 3 ▸ Depiction of the SBIR role played by PEOs. (While this figure is Navy-specific, both the Army and Air Force are moving in this direction, in concert with DoD policy.)

A topic writing workshop is one way to enhance your firm's ability to advance topic ideas to topics ready for publication. The workshop—perhaps a webcast or videocon—requires a skilled and experienced facilitator. (A topic writing workshop could be included during conferences or meetings when the right participants are present.) Attendees would include top, mid- and intern level participants from your company. The workshop goal is to produce completed topic drafts and influencing strategies.

In devising a topic, a technology transition plan, including funding, should be envisaged for a product to be delivered in 3-5 years. After the topics are identified in a topic-writing workshop, the influencing strategy to advocate for the draft topic would be devised, with activities assigned and scheduled. Timing is important for topic generation and submission—it should link up with SBIR Program Office topic calls.

Step Six: Optimize your Participation in SBIR/STTR Phase I and II Activity

6

After a topic is selected, the government assumes the responsibility to advertise, receive and evaluate proposals. You can, and should, formally sup-

port proposals that accord with your needs. For example, your company could serve as a subcontractor on a Phase I project, providing the government with evidence of an increased likelihood of downstream transition. Alternatively, you could write a letter of support, which the applicant could include with its proposal. Depending on the quality of proposals, several will be selected for Phase I feasibility studies.

During Phase I, you should endeavor to meet with the small firm and establish non-disclosures agreements and begin the planning process. In some cases, the relationship may be established before the Phase I proposal is submitted.

Only Phase I awardees can be considered for either Phase II or Phase III. In most cases, a Phase II proposal should describe the development of a prototype that will be definitive enough to interest you as a prospective partner in transition. Therefore, you should help the awardee understand what the prototype needs to be and what military qualification requirements need to be met. Assume that if a topic is advertised, there is a Phase III expectation. A small firm needs to understand what must be produced and demonstrated prior to Phase II consideration. The attributes of the final product (e.g., size, weight, performance—including preliminary test and evaluation—and cost) should be articulated before the Phase II proposal is written. Ideally, later decisions to proceed through a gated transition process will be less subjective and depend more on performance demonstrated.

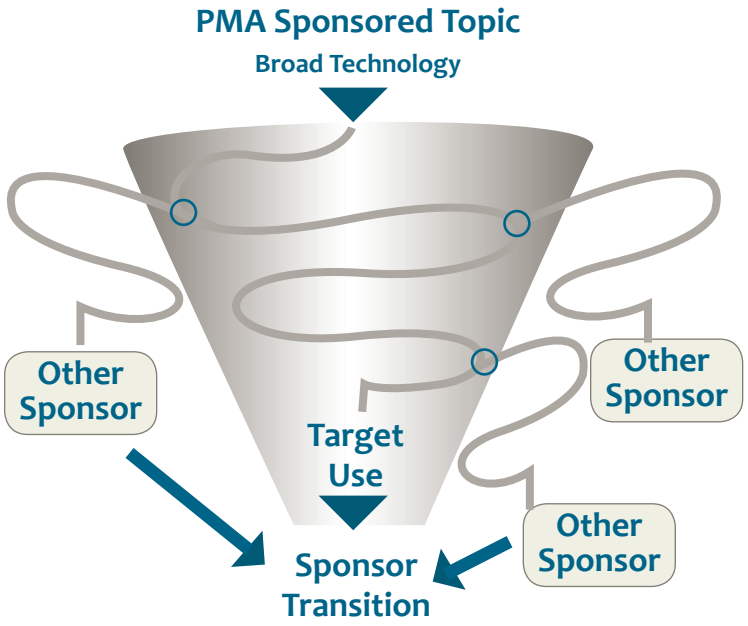
It will be essential that your company provide a detailed letter of support for a Phase II proposal. This letter of support must describe to what platform/subsystem the technology will transition and when. Most DoD SBIR programs will welcome your involvement, as they realize that some level of subcontract support will be needed to achieve transition. The Phase II selection process involves more than picking the best technology; its implementation and transition to Phase III are also important.

7 Step Seven: Identifying Other SBIR/STTR Infusion Scenarios

If your deliverables for a government customer fall short of expectations, one option may be to identify SBIR/STTR projects that can address these technological gaps. Whether one is seeking a lighter material or smaller laser, it is likely that one or more SBIR/STTR companies already have been funded to develop technologies that might help. Moreover, these SBIR/STTR companies have completed the competition requirements that allow them to receive sole source contracts for further development work. Their agility allows for a very rapid response to your specific need.

Figure 4 ▸ Unpredictability of Technology Development

The road to transition will not be straight



"Only Phase I awardees can be considered for either Phase II or Phase III. In most cases, a Phase II proposal should describe the development of a prototype that will be definitive enough to interest you as a prospective partner in transition. … Assume that if a topic is advertised, there is a Phase III expectation."

Figure 4 ▸ Depiction of the unpredictability of technology development and introduction to the concept of SBIR value in disruptive technologies to the customer stream.

1.6 Frequently Asked Questions

1. Aren't there contradictory references to SBIR/STTR data rights in DFARS?
   See Section 2.5

2. Do SBIR/STTR topics align with ACAT program roadmaps and program blocks?
   See Section 3.1-2 and 5.3

3. How can I most efficiently identify SBIR/STTR candidates for my specific system or subsystem needs?
   See Section 7.1-3

4. How up-to-date, accurate and detailed is SBIR/STTR project information provided in the key DoD and DoD agency SBIR/STTR project databases?
   See Section 7.1

5. Do SBIR/STTR programs vet their awardees to assess strengths and weaknesses of concern to me, such as scale-up or manufacturing capability?
   See Section 5.4

6. Can I efficiently map an SBIR/STTR awardees' history through federal portals?
   See Section 7.3

7. How can I best determine an SBIR/STTR awardees' understanding of what it will take in time, work and dollars to mature a technology project up the TRL ladder?
   See Section 5.3-5 and 6.1

8. How can I identify technology maturation funding sources other than my IR&D funds?
   See Section 5.5 and 6.2

9. I've heard that SBIR/STTR topics submitted by industry, even when requested, are usually rejected by DDR&E. Is this true, and if so, why – and what can do to improve topic candidate language?
   See Section 3.1-2

10. How does the Commercialization Pilot Program impact my SBIR/STTR work?
    See Section 8.1-3

11. What is the policy on SBIR/STTR awardee subcontracting back to my firm?
    See Section 4.2 and 5.2

12. Under what circumstances can I assume that an SBIR/STTR awardee has a workable degree of familiarity with the sequence of partnering steps?
    See Section 4.1 and 5.1

13. Where can I go to obtain a clear understanding of how the Open Architecture initiative impacts SBIR/STTR and my prerogatives with respect to establishing a Technology Collaboration Center?
    See Section 5.7

14. Army, Air Force, Navy and Missile Defense Agency SBIR/STTR programs appear to have very different structures. How do I identify a program POC when non-legal problems develop in a Phase I or Phase II partnership?
    See Section 1.9, 6.3, 9.1 and 10.0

15. What type of commitments must I be prepared to make to help ensure successful transition of an SBIR/STTR technology?
    See Section 2.6-7, 4.3 and 5.3

16. Are there proven, available SBIR assessment and risk management tools?
    See Section 5.5, 6.1

17. What SBIR/industry success stories can be consulted?
    See Section 1.11

Core Documents and Links from the SBIR/STTR Reference Guide

SBA Policy Directive, Small Business Innovation Research (SBIR) Program
▸ www.sba.gov/idc/groups/public/documents/sba_program_office/sbir_policy_directive.pdf

An Assessment of the Small Business Innovation Research Program
▸ books.nap.edu/catalog.php?record_id=11989

An Assessment of the SBIR Program at the Department of Defense
▸ www.nap.edu/catalog.php?record_id=11963

An Assessment of the SBIR Program at the National Institutes of Health
▸ books.nap.edu/catalog.php?record_id=11964

An Assessment of the SBIR Program at the Department of Energy
▸ www.nap.edu/catalog.php?record_id=12052

An Assessment of the SBIR Program at the National Science Foundation
▸ books.nap.edu/catalog.php?record_id=11929

▸ 2.1 SBIR and STTR Contrasted

SBIR and STTR are similar programs, in that both share the same three-phase structure, with identical funding limits in each phase. There are two principal differences: (1) SBIR is a much larger program, with a 2.5% RDT&E set-aside versus STTR's 0.3% set-aside; and (2) STTR requires collaborative research between the small business and a non-profit Research Institution. In this arrangement, the small business submits the STTR proposal and the Research Institution serves as a subcontractor if the STTR contract is awarded. SBIR also permits Research Institutions to be subcontractors, but such collaborations are optional.

A Research Institution is defined as non-profit entity that is organized for scientific or educational purposes. All colleges and universities, so long as they are non-profit, are considered eligible as Research Institutions. Likewise, all Federally Funded Research and Development Centers (FFRDCs) are eligible for STTR collaborations. The FFRDCs, which typically are government owned and contractor operated, include the DoD's Lincoln Laboratory and Applied Physics Laboratory, NASA's Jet propulsion Laboratory, and the DOE's set of national laboratories (Oak Ridge National Laboratory, Lawrence Livermore National Laboratory, Pacific Northwest National Laboratory, etc.)

With respect to the set-aside disparity between SBIR and STTR, the difference is substantial. For the DoD in FY2008, these set-asides provided $1.14 billion and $132 million for SBIR and STTR, respectively. (Note that fewer agencies participate in STTR compared to SBIR. Whereas agencies with extramural R&D budgets exceeding $100 million per year must participate in SBIR, only those agencies with extramural R&D budgets exceeding $1 billion per year must participate in STTR. In addition to the DoD, four other agencies—DHHS (largely NIH), NASA, DOE and NSF – have STTR programs.)

The two programs also differ with respect to the level of effort required by the small business and the Research Institution. In STTR, for both Phase I and Phase II, the small business must perform 40% of the work and the Research Institution must perform 30%. The remaining 30% can be performed by the small business, the Research Institution, or any other entity (including large businesses, other small businesses and other Research Institutions—whether organized for profit or not).

Usually, the percentages are based on the dollars spent by each party. In SBIR, the level-of-effort restriction is on the small business only and differs for Phase I and Phase II. In SBIR, the small business must perform at least two-thirds of the work in Phase I and one-half of the work in Phase II. As with STTR, the remainder of the work in SBIR can be done by any entity. (But note that government-owned/government-operated institutions—e.g., the Naval Research Laboratory or the National Institute for Standards and Technology—are not eligible to be subcontractors in either program.)

A fourth difference concerns the role of the Principal Investigator (PI). In SBIR, the PI must have his/her principal place of employment with the small business at the time of award and during the period of performance of the SBIR contract. For most agencies with STTR programs, including the DoD, the principal place of employment of the PI can be either the small business or the Research Institution.

Finally, for STTR only, the small business concern must negotiate a written agreement between the small business and the research institution, allocating intellectual property rights and rights to carry out follow-on research, development, or commercialization. Although this agreement is not required for SBIR, it may still be a good idea for the small business, and any subcontractor, to have such an understanding before work begins on the SBIR project. A written agreement can be used to avoid disputes later on, should significant technical achievement arise from the research project.

2.2 Commercialization Pilot Program (CPP)

For substantive CPP information, see Section 9 of this document.

2.3 FAR and DFARS on SBIR/STTR Data Rights

The Federal Acquisition Regulation (FAR) and the Department of Defense Federal Acquisition Regulation Supplement (DFARS) are governing federal documents regarding SBIR/STTR data rights. It is imperative to clarify the issues of SBIR data rights conveyance and monopolization of new technology development, basing this clarification on the SBA's 2002 Final Program Policy Directive. According to this directive, a Phase III award is defined as work that (1) derives from, extends, or logically concludes efforts performed under prior SBIR funding, and (2) is funded with non-SBIR monies; Phase III awards are, by their nature, SBIR awards.

In some SBIR Phase III transactions, confusion has arisen about SBIR data rights conveyance regarding two DFARS contract clauses: 252.227-7013 *Rights in Technical Data – Noncommercial Items* and 252.227-7018 *Rights in Noncommercial Data and Computer Software – Small Business Innovation Research Program*. Some have argued that citation of the former clause in a SBIR Phase III is appropriate and sufficient, and others have responded that only 252.227-7018 ensures that SBIR data rights flow down to the small business subcontractor – and that the 252.227-7018 language must be included in every Phase III award.

There is a related concern that SBIR data rights conveyance in a Phase III contract establishes a monopolistic, permanent position for an SBIR awardee with respect to a technology solution resulting in a Phase III contract.

Given that Phase III awards are, by their nature, SBIR awards, they serve to extend these non-disclosure protections to all SBIR awards in the linear progression prior to the Phase III award for another 4 years (for civilian contracts) and 5 years (for military contracts) after completion of the Phase III award. SBIR data rights apply to all Phase III awards. Thus, the SBIR FAR clause 52.227-20 or the DFARS clause 252.227-7018 must be included in every Phase III award. Specifics set forth in SBIR clauses in the FAR and DFARS should be summarized. (See *Background* on page 16.)

Citation of DFARS 252.227-7013 in a prime contract with a defense acquisition program office does not ensure that SBIR data rights flow down to an SBIR-awardee subcontractor. The Government receives a royalty-free license only in technical data generated under SBIR contracts; DFARS 252.227 -7018 differs from clauses -7013/7014 in this respect.

BACKGROUND

DFARS 252.227-7104 *Contracts Under the SBIR Program* (a) requires contracting officers to use clause -7018 "when technical data or computer software will be generated during performance of contracts under the SBIR program." Moreover, the SBA SBIR Policy Directive denotes a new regime for small business data rights protection; specifics are set forth in SBIR clauses in the FAR and DFARS:

- Agencies must protect all proprietary information, and must refrain from disclosing all information generated under an SBIR funding agreement, except for limited purposes.
- Protections last "for not less than 4 years" – for DOD, 5 years.
- Agencies cannot use SBIR rights in technical data to produce future technical procurement specifications.
- Agencies must insert the SBIR technical data rights clause in every Phase III contract; SBIR technical data rights are non-negotiable during Phase III award.
- Agencies may not in any way make issuance of an SBIR award, including a Phase III, conditional on data rights.
- Agencies may not diminish or remove SBIR Phase III technical data rights during contract administration.
- SBA must immediately report to Congress any attempt or action by an agency to condition, exclude or diminish SBIR data rights.
- SBIR contractors must affirmatively act to preserve their rights: identify data that they bring to the contract; assert rights to it; describe the basis for the assertion; and, provide the name of the company asserting rights.

On the monopolization issue: SBIR data rights conveyance in a Phase III contract does not establish a monopolistic, permanent position for an SBIR awardee with respect to a technology solution resulting in a Phase III contract. As long as proprietary data covered by SBIR data rights conveyance is not revealed by an acquiring prime contractor, for example, that prime may choose to re-compete the specific technology need met in a previous Phase III contract with a SBIR awardee. Thus, a prime contractor is not locked into a continual acquisition relationship with an SBIR awardee for a specific technology need.

IN SUMMARY

SBIR data rights apply to all Phase III awards. Thus, the SBIR Federal Acquisition Regulation ("FAR") clause 52.227-20 or the Department of Defense Federal Acquisition Regulation Supplement ("DFARS") clause 252.227-7018 must be included in every Phase III award.

SBIR data rights attach to all technical data or computer software generated under the SBIR award and give the Government rights to use the data or software at issue for any Government purpose. However, except under very limited circumstances, the Government cannot, without the permission of the SBIR business, release or disclose SBIR-generated data or software to any person other than its support services contractors. This restriction ensures that no technical data or software that constitutes a trade secret of the SBIR business will be disclosed by the Government. The non-disclosure obligations continue only for the period starting with the SBIR award and ending four years (in the case of civilian contracts) and five years (in the case of military contracts) after the completion of the project under which the data was generated.

Given that Phase III awards are, by their nature, SBIR awards, they serve to extend these non-disclosure protections to all SBIR awards in the linear progression prior to the Phase III award for another four years (for civilian contracts) and five years (for military contracts) after completion of the Phase III award. The extension of prior SBIR award non-disclosure protection periods by a subsequent SBIR award, including a Phase III, is known as the "rollover" provision.

▸ 2.4 SBA Final Policy Directive on SBIR Data Rights

The enabling legislation for SBIR (Public Law 97-219, codified in 15 USC 638) required the Small Business Administration (SBA) to issue a Policy Directive for the program, which would include a provision for the "retention of rights in data generated in the performance of the contract by the small business concern." Subsequent legislation (Public Law 102-564) strengthened the data rights provision by instructing the SBA to modify its Policy Directive to assure that agencies protect the data "generated by the (small business) concern in the performance of an SBIR award for a period of not less than four years." Finally, Public Law 106-554 instructed the SBA to clarify that the data rights provision applies not only to awards made in Phase I and Phase II, but also to awards made in Phase III.

The latest version of the SBA Policy Directive[3] includes the following provisions with respect to data rights:

3 | SBA's *Final Policy Directive* on SBIR is dated September 2002, but has been continuously updated.

- The Act provides for "retention by a small business concern of the rights to data generated by the concern in the performance of an SBIR award."

- SBIR agencies must protect from disclosure and non-governmental use all SBIR technical data developed from work performed under an SBIR funding agreement for a period of not less than four years from delivery of the last deliverable under that agreement (either Phase I, Phase II, or federally-funded SBIR Phase III).

- Agencies are released from obligation to protect SBIR data upon expiration of the protection period, except that any such data that is also protected and referenced under a subsequent SBIR award must remain protected through the protection period of that subsequent SBIR award. For example, if a Phase III award is issued within or after the Phase II data rights protection period, and the Phase III award refers to and protects data developed and protected under the Phase II award, then that data must continue to be protected through the Phase III protection period.

- The Government retains a royalty-free license for Government use of any technical data delivered under an SBIR award, whether patented or not.

- SBIR technical data rights apply to all SBIR awards, including subcontracts to such awards, that fall within the statutory definition of Phase I, II, or III of the SBIR Program. The scope and extent of the SBIR technical data rights applicable to federally-funded Phase III awards is identical to the SBIR data rights applicable to Phases I and II SBIR awards.

- The data rights protection period lapses only: (i) upon expiration of the protection period applicable to the SBIR award, or (ii) by agreement between the awardee and the agency.

- These data rights provisions are non-negotiable and must not be the subject of negotiations pertaining to an SBIR Phase III award, or diminished or removed during award administration. An agency must not, in any way, make issuance of an SBIR Phase III award conditional on data rights.

- If the SBIR awardee wishes to transfer its SBIR data rights to the awarding agency or to a third party, it must do so in writing under a separate agreement. A decision by the awardee to relinquish, transfer, or modify in any way its SBIR data rights must be made without pressure or coercion by the agency or any other party.

2.5 Core DoD and DoD Agency Policies, Directives and Memoranda

Throughout the first decade of SBIR/STTR operation, the program was funded at a low level; its visibility within DoD was limited, and it attracted few champions. But, as overall Navy RDT&E funding rose in the 1990s, and SBIR/STTR leadership became more aggressive about program visibility and utility, the program attracted increased interest at senior levels in the DoD acquisition community.

Following completion in1997 of DoD-wide SBIR Process Action Team plans to enhance the relevance of SBIR/STTR to warfighter needs, the program got its first major DoD champion, Undersecretary for Defense – Acquisition & Technology Dr. Jacques Gansler. His February 1998 DoD memo on SBIR is considered a landmark document with its call to "Develop specific policies to involve the acquisition programs in the process for developing SBIR topics and/or selecting SBIR projects …"

That memo trigerred numerous other DoD memoranda, directives and policy statements guiding SBIR/STTR growth, especially growth towards commercialization/transition success. Of releasable documents, 33 of greatest import are collected in an independent publication, SBIR Process Actions – A Sourcebook of Selected Documents (1982-2004).[4]

2.6 DoD 5000.2 and Defense Acquisition Guide (DAG)

As one measure of growing acceptance of the SBIR/STTR program as an innovative technology resource for DoD acquisition needs, the DoD 5000.2 instruction and the Defense Acquisition Guide, among other core DoD acquisition documents, reference SBIR/STTR as a potential source of innovative technologies whose development acknowledges the need to mitigate risk.

2.7 Major reports and studies: National Research Council, RAND Corp.

In addition to major reports and studies on the DoD SBIR program by prestigious independent assessment teams, lesser—but still valuable—scrutiny of DoD SBIR policy and practice has been and continues to be conducted, with resulting publications.

2.7.1 National Research Council report: An Assessment of the SBIR Program

In 2000, the U.S. Congress requested the National Research Council (NRC)

4 | Robert-Allen Baker; SBIR Process Actions – A Sourcebook of Select Documents (1982-2004); Vital Strategies LLC; Norfolk, VA; 2005. This publication is subject to updating by its authors.

of The National Academies to "conduct a comprehensive study of how the SBIR program has stimulated technological innovation and used small businesses to meet Federal research and development needs," and to make recommendations with respect to the SBIR program. The NRC study has assessed the SBIR program as administered by the five federal agencies that together make up approximately 96% of SBIR program expenditures: the Department of Defense, the National Institutes of Health, the National Aeronautics and Space Administration, the Department of Energy and the National Science Foundation.

The NRC study sought to understand operational challenges and measure program effectiveness, including the quality of the research projects being conducted, the challenges and achievements in the commercialization of the research, and the program's contribution to accomplishing agency missions.

NRC study findings include the following:

1. each year, over one-third of the firms awarded SBIR funds participate in the program for the first time;
2. just over half of the projects reach the marketplace;
3. as with investments made in early stage companies by angel investors or venture capitalists, commercialization success is highly skewed – only a small percentage of projects achieve large growth and significant sales revenue;
4. nonetheless, many small successes together continue to meet agency research needs and contribute to the nation's innovative capability;
5. teaming among the SBIR awardees, the SBIR program managers, agency procurement managers and increasingly, the prime contractors, is important in the transition from projects to products to integration in systems; and
6. at the DoD, the growing importance of SBIR within the Defense acquisition system is reflected in the growing interest of prime contractors.

These findings and others can be found in the report, *An Assessment of the SBIR Program*, which has recently been made available on-line. Also available on line are separate SBIR assessments of four of the five major agencies, excluding NASA. (Links to these assessments are provided at the beginning of this Section.)

2.7.2 RAND Corp. Studies on DoD SBIR

The OSD Office of Small Business Programs has commissioned the RAND Corp. to focus on key areas of SBIR performance—not in competition with NRC's work, but as a complement to it. Of these studies, the most pertinent to the defense technology transition challenge from a prime contractor perspective is *Evaluation and Recommendations for Improvement of the Department of Defense Small Business Innovation Research (SBIR) Program.*[5] Some recommendations focus on improving primes' takeup of SBIR/STTR technologies, including brief discussions of dedicated Phase III transition funding and fiscal incentivization of primes to partner with SBIR firms.

2.7.3 Other Assessments of DoD SBIR Policy and Practice and Periodicals

Following the founding in 2005 of an independent small defense technology business advocacy group, Defense Technology Small Business Advisors, a series of white papers on SBIR policy and practice began to appear that reflected a dialogue between veteran small firms working the defense industry marketplace and large prime contractors. Of these, the most pertinent from the primes' perspective is *Mining the Small Business Resource: How Can Small Business Better Support the Nation's Defense Mission?* [6]

Several commercial periodicals, many of them web-based, publish information on DoD SBIR/STTR policy and practice; the most familiar of these, The SBIR Insider Newsletter, is posted in *The SBIR Gateway* at www.zyn.com. An in-depth government-sponsored periodical, *Transitions*, is focused on Navy SBIR/STTR practice. It is published by the Navy SBIR TAP contractor, Dawnbreaker Inc., and is available at www.navysbir.com.

5 | Bruce Held et al; Evaluation and Recommendations for Improvement of the Department of Defense Small Business Innovation Research (SBIR) Program; RAND Corp.; 2006

6 | Mining the Small Business Resource: How Can Small Business Better Support the Nation's Defense Mission?; Small Business Technology Council; Washington, DC; 2007

Section 3.0 | SBIR/STTR Topic Development

Core Documents and Links from the SBIR/STTR Reference Guide

▸ SBIR Program	Section I, I-27

▸ 3.1 Topic Development and the Approval Process

The key components of topic development include understanding topic success criteria, developing the right topic team and preparing a follow-up strategy.

▸▸ 3.1.1 What is the "Right Topic?"

The "right topic" to develop and submit is one based on a clearly-defined need—shared by the prime[7] and government customer—which has a complementary transition path for the solution. A topic without prime support via IRAD funding, and/or without acquisition program office support via Phase III funding, will likely produce an SBIR/STTR project that will languish after Phase II for lack of fiscal support, and probably not survive the subsequent "valley of death".

Therefore, the critical first step in topic development is close collaboration between a prime POC and their opposite number in a PEO and/or acquisition program office—a team effort. This is a marketing step designed to mitigate risk and to ensure the success of a topic that will generate ~$1M in catalytic Phase I and II funding. If a prime's topic concept is received with enthusiasm on the PEO side, the result will be help in pushing the topic through the approval cycle.

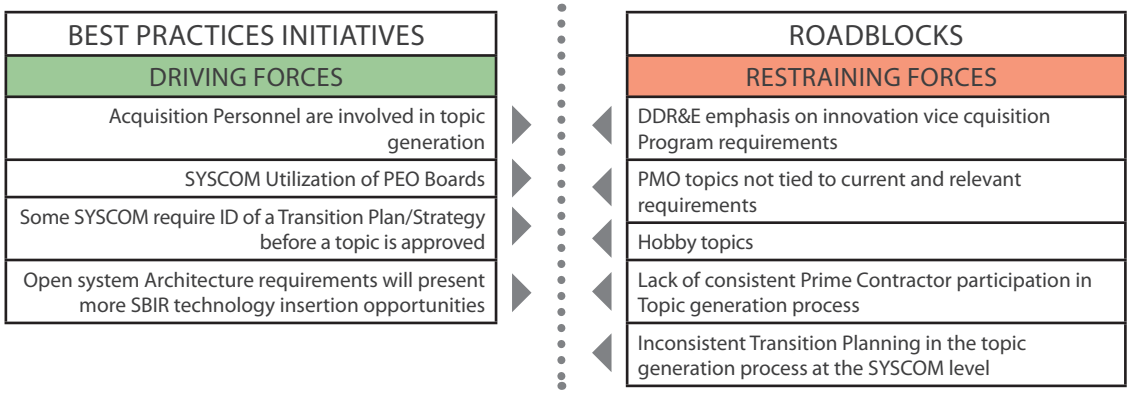
▸▸ 3.1.2 How is the "Right Topic" Generated?

The "right topic" will be a team effort, the team consisting of key prime and government persons with responsibility for transition of a specific technology; moreover, this team will continue to collaborate over the life of the SBIR/STTR project. Initially, the team will be more technical; however, during the set up for Phase II and as Phase II enters into the second year, the team will feature program specialists.

7 | "Prime", for the purposes of this discussion, may be defined as including and channeling the contributions of large and small suppliers, or prospective suppliers.

Figure 5 ▸ Right Topic

Choosing the right topic is essential to transition success. SBIR topics must be timely and relevant to the needs of the customer, the acquisition program and the warfighter who will use the technology.



Source: A Report on the Navy SBIR Program: Best Practices and Roadblocks; June 2008; p.16

A team needs both government and non-government, technical, test and evaluation, and product development experts. Whereas most of the administrative work is done by the government, a legal, budget and contracting expert from the prime should be consulted. Depending on the technology, information technologists, systems integrators, logisticians and manufacturing experts will also be needed. Finally, every effort should be made to contact end-users.

▸▸ 3.1.3 What Follow-up is Needed During Topic Approval Process and Beyond?

After the topic is submitted, the prime will need to actively track its progress to ensure that it doesn't fall through the cracks, or its intent is misunderstood or insufficient. Remember that all topics need a final approval from the Director of Defense Research & Engineering (DDR&E) to ensure appropriate innovation content; if a topic is rejected by DDR&E, there is a narrow window for topic editing, and one-time reconsideration.

Once approved, the government will take on the greater share of the work for the next year. The stronger the team and its commitment, the easier the government job becomes. For example, while the government will answer small business questions while the solicitation is open, prior team submission of background information (papers or specs to be posted on SITIS) will help ensure that the small companies understand exactly how the technology will need to function. Team members should plan to be available via phone during this Q&A period. This post-topic approval work should be considered as an important part of topic development, because the purpose of topic development is to ensure that a need for an innovative technology solution is met.

3.2 Proposing Optimal Topics

Strategies for optimal topic development include topic-writing workshops, appropriate follow-on planning and cluster topic development:

3.2.1 Topic-Writing Workshops

An efficient method of taking topic ideas to complete, publication-ready topic write-ups is a workshop using a SBIR Program Office POC as a facilitator. This can be accomplished by making a one-day investment that helps set technology development strategy for three years. Attendees include top, mid- and intern level transition stream participants (see team composition, above) from both government and industry, and an SBIR facilitator. A typical agenda would include:

30 minutes	"SBIR 101"
60 minutes	Top level matching of S&T roadmaps
60 minutes	Topics brain storming
Break	
45 minutes	Prioritizing
30 minutes	Topic writing tutorial
60 minutes	Topic writing

The best time to schedule a topic-writing workshop is during a conference or meeting where most of "the right people" are already present. Tier 1 and 2 suppliers and other agencies may participate. Once the near- and long-term capability gaps that are not currently funded or staffed are identified and prioritized, these gaps can be turned into a proposed topic quickly as

the write-up is generally less than two pages. Leaving the write-up broad allows for more innovation and SITIS allows for background clarification.

▸▸ 3.2.2 Follow-on SBIR/STTR Project Planning

After topics are prepared for submission, SBIR/STTR project partnership staffing and a communication chain should be considered. A single point of contact from government and industry is recommended, and the communication must be two-way. Because the SBIR/STTR program yields results in a short timeframe, it is an optimal training opportunity for an industry intern who is a candidate for advancement—as well as an opportunity for interns to get to know their government customer. A mentor from the mid to upper-level will be needed to guide in the decision- making and to receive regular reporting.

▸▸ 3.2.3 Topic Clustering

For larger Programs of Record, or for DoD agencies looking to integrate large components with multiple elements, clustering multiple topics that will aggregate into that component is recommended. Multiple small companies can be sought to build the sensors, algorithm, new materials, etc. This would involve a larger investment in SBIR funding and planning that involves a number of transition stream players. Therefore a strong commitment from both the prime and program office must be demonstrated to obtain approval of a topic cluster. This is a powerful way to insert state-of-the-art innovation and disruptive technologies into a program, and there is recent DoD agency SBIR/STTR precedent for such practice.

Section 4.0 | Phase I Partnerships

Review of Salient Documents

Core Documents and Links from the SBIR/STTR Reference Guide

▸ SBIR Program	Section I, I-27
▸ Reports/Submissions	Section I, I-57

COMMENTARY

A compelling reason to form Phase I partnerships for large firms is the possibility downstream of acquiring the SBIR/STTR "sole source" rights to a promising technology.[8] While most large defense contractors—and an increasing number of suppliers—expect to field requests for support letters to accompany Phase I proposals, some industry and government veterans advocate for a "Phase 0" in which both large and small firms can take a critical first look at one another. What's key for the large firm is to first decide whether SBIR/STTR pursuit has as its purpose long-term IRAD benefits, or product innovation at the system level for a program designed to meet priority defense needs.

Because Phase I contracts are rarely funded above $100,000, and over just a six to nine-month period, to establish proof-of-principle, large firms may find it hard to justify a Phase I partnering effort beyond simple letters of proposal support. In fact, once the Phase I award has been made and the awardee become conversant with transition requirements and form/fit/function issues, with large firm guidance coordinated by the project TPOC, to ensure project innovation by the small firm it may be best for both large firm and government engineers to retreat, awaiting Phase I innovation results.

This section explores the range of Phase I partnering opportunities and the business rationale for pursuing these opportunities. While core federal documents have little to say about Phase I partnering, abundant Phase I partnering resources are available at the state and regional levels. But much of best practice here is anecdotal, from industry sources.

▸ 4.1 Pre-award SBIR/STTR Proposal Support

Pre-award Phase I partnering includes three types of activities: "Phase 0" introductions, value stream assessment and SBIR/STTR project needs assessment.

8 | These rights, described in the 2002 SBA *SBIR/STTR Final Directive* , are intended to ensure customer capture but have been diluted by recent federal court rulings such as *Night Vision vs.* The United States of America.

4.1.1 "Phase 0" Introductions

Phase 0 introductions are greatly facilitated by small firm exhibits such as those seen at the annual Navy Opportunity Forum, annual small business conferences held by the Army and Missile Defense Agency, semi-annual Air Force SBIR Commercialization Pilot Program (CPP) conferences, and annual state-sponsored small firm events, such as the one Connecticut Center for Advanced Technology holds. (For a comprehensive annual calendar of such events, go to navysbir.com *Events Calendar.*) Highest-value events, such as the Navy Opportunity Forum, debut large numbers of small firms, and provide extensive small firm and technology information on websites that support deep scrutiny with minimal effort – and increasingly, DoD SBIR/STTR programs want industry's opinion on what information is optimal.

But industry can and does create similar venues of its own, ranging from web-mounted virtual conferences where numbers of small firms, already preliminarily vetted against specific prime needs, are introduced to an internal corporate audience, to actual events with similar content and participation. One advantage of such corporate events is the sponsor's ability to estimate a variety of customer applications across different business units for individual SBIR/STTR technologies or core competencies.

A hybrid industry-government event is emerging with the 2008 joint Air Force/Navy CPP conference, in which different primes serially co-sponsor technology transition mining with federal SBIR/STTR programs, focusing on matching specific program needs with candidate pools of relevant SBIR/STTR projects selected from government databases.

In each of the above "Phase 0" activity modes, the goal is the same: to identify and narrow a vibrant SBIR/STTR candidate pool. The result can be a focused, business-driven approach to providing Phase I proposal letters of support.

4.1.2 Value Stream Assessment

Value stream assessment, using due diligence materials and tools, has as its purpose during pre-award work the practical alignment of a candidate SBIR/STTR project with a technology need of a system or subsystem in one particular phase of a contracted Program of Record (PoR). While SBIR/STTR has in the past been associated with pre-Milestone B technology development, in fact SBIR/STTR is a far broader resource. The following diagram depicts SBIR contributions across defense acquisition program phases:

Figure 6 ▸ SBIR Contributions Across Defense Acquisition Program

Source: www.acq.osd.mil/osbp/sbir/overview

As "technology gap" needs are identified and Phase 0 work commences in assembling SBIR/STTR candidate pools, value stream assessment of a candidate takes the form of preliminary risk assessment. While more sophisticated risk assessment tools are best deployed during the course of a post-Phase I award partnership, at the earliest stage the prime wants a snapshot of a small firm's core competencies, its award and commercialization history, and its manufacturing potential. This snapshot enables development of a realistic, comprehensive project needs assessment that identifies tasks that are beyond a small firm's capability.

4.1.3 SBIR/STTR Project Needs Assessment

The SBIR/STTR project needs assessment follows the two previous activities, and immediately precedes the drafting of a Phase I proposal support letter. Many support letters only generally recommend a technological approach. This is because too little Phase 0 and assessment work has been done to produce a compelling support letter that (a.) assesses a proposed technological approach in terms of its value to a particular system/subsystem in a program block of a contracted Program of Record and (b.) specifies a partnering role and the functions the prime might play post-SBIR/STTR award. Such a support letter offers value to federal decision-makers, who want to ensure the likely payoff of an SBIR/STTR award investment, but also offers prospective value to the prime itself.

A preliminary, pre-award project needs assessment will clarify what roles should be filled and which are appropriate to the prime. In too many cases, authors of a more general prime's support letter end up asking, "What ever happened to that SBIR firm? We never heard from them again." A more thorough pre-Phase I award interaction can help protect that investment of time.

Finally, this needs assessment should cover all Phase I awards made for a specific topic, as assessment of each project may reveal a pattern of complementary strengths and weaknesses such that the optimal Phase II might be a single collaboration by two or more Phase I awardees. A large firm could offer such input to the PEO sponsoring the topic.

For example, multiple firms may be selected for Phase II with a brass board deliverable in nine months. The results of their brass board demonstration then determines which companies will continue to develop a prototype, which is pre-negotiated as an option. The second option of developing a prototype for further T&E will again use the test results to determine who receives funding for the third option of a prototype development ready for environmental T&E. This competitive approach is all about mitigating risk of the technology and gives insight into the business maturity of the small company. Both the program office and large firm need to work out their Phase II strategy with the SYSCOM/PEO SBIR Office.

4.2 Phase I Subcontracts

By law and SBA regulation, an SBIR Phase I awardee must perform at least 67.5% of Phase I work and may subcontract remaining funds. STTR Phase I awardees must perform at least 40% of Phase I work, with their required

research partner performing another 30% or more, and remaining funds may be subcontracted. With Phase I awards capped at $70K to $100K, depending on DoD agency, most primes find that the time and effort to get a permissible subcontract in place is contraindicated.

However, given the history of dispute and disagreement over SBIR/STTR data rights (see Section 11: Dispute Resolution), some primes use the six to nine-month Phase I award period to put in place simple partnering agreements. For example, a Memorandum of Understanding (MOU) or Letter of Intent (LOI) – to establish clear partnership guidelines for a subsequent Phase II relationship, to ensure against potential obstacles. These MOUs and LOIs, which may reflect findings from pre-SBIR/STTR award project need assessments, are always preceded by a Non-Disclosure Agreement (NDA). Increasingly such NDAs are transacted during Phase 0 activity, so as not to slow subsequent interaction. While NDAs are typically enacted by corporate legal staff, it is key that large firm engineers participating in a SBIR/STTR partnership clearly and fully understand NDA contents.

▸ 4.3 Transition Planning

Currently, DoD SBIR/STTR regulations require that Phase I proposals at least cursorily address how the commercialization/transition path for a SBIR/STTR project is envisaged. In the past, Phase I proposals have lacked strength here. But today, between informed guidance from a prime on program insertion opportunity, the requisite transition path thereto, and parallel informed guidance from the SBIR/STTR topic author during a 60-day discussion window (see: dodsbir.com/sections, *Overview-Getting Started*) prior to proposal submission, a small firm should be able to at least summarily describe a project's commercialization/transition path in a Phase I proposal. One key contribution a prime can make in this process is to help the SBIR proposer identify the Technology Warrant Holder for the relevant PoR, because it is the Warrant Holder who will make a final decision on technology acceptance and "owns" the relevant technology roadmaps.

This possibility resonates with 2007 Navy SBIR Primes Survey finding that SBIR/STTR partnerships will significantly benefit from knowing as much as possible, as early as possible in Phase I work, about a project's transition path and the array of potential transition stream players (offices and individuals in both industry and government). The 2007 Navy SBIR TPOCs Survey produced the same priority finding, pointing to the possibility of deeper TPOC collaboration in Phase I partnerships.

In consequence, some DoD agencies, led by Navy, have launched Phase I transition assistance pilot programs in which substantive amounts of transition information are provided to randomly selected Phase I awardees. Data collection on the results will determine whether or not such pilot transition assistance accelerates SBIR/STTR project maturation and improves Phase II outcomes. Prime partners in SBIR Phase I projects could greatly enhance these pilot initiatives.

Moreover, in at least one Navy SYSCOM, SBIR project transition discussions play a role in recommending Phase II candidates. These discussions, which assess innovation potential in an acquisition context, may benefit from large firm input on innovation potential.

Finally, an increasing number of Program Executive Offices (PEOs) have a full-time SBIR Technology or Transition Manager, often titled "SBIR/STTR Coordinator". In very large PEOs such as NAVSEA's PEO Ships, these are separate positions with the Coordinator leading projects management. These staff are key to technology transition stream work, including all transition planning.

4.4 Leveraging State, Regional Funds

In past years, the now defunct FAST program, adjunct to SBIR/STTR, encouraged state championing of these federal programs. But FAST activities had sufficient impact on state and regional thinking about the benefits of SBIR/STTR, that today, about 20 states offer some form of support for pre- and/or post-Phase I award activity.[9] Pre-award support, ranging from $1.5K to $5K, is available on a competitive basis to small firms for proposal development and/or review. Post-award support, ranging from $25K to $100K, is available on a competitive basis to small firms as either a Phase I matching grant or to cover the gap between Phase I and Phase II funding.

9 | The Navy SBIR Program Office plans to add this list to its website by 1 January 2009.

Section 5.0 | Phase II Partnerships

Core Documents and Links from the SBIR/STTR Reference Guide

▸ SBIR Program	Section I, I-27
▸ Reports/Submissions	Section I, I-57
▸ SBIR/STTR Phase II Instructions	Section I, I-61
▸ Phase II Transition Plan	Section I, I-107
▸ S&T to Production Risk Assessment Tool (SPRAT)	Section III, III-131

COMMENTARY

While core SBIR/STTR program documents have much to say about Phase II proposal development, including detail on required transition planning and Phase II funding amendments, these federal documents are silent on Phase II partnering strategies. Nor are there state-level resources available for Phase II activity, to match Phase I resources at state and regional levels. Yet, the bulk of SBIR/STTR partnering activity occurs during Phase II. Therefore, virtually all best practice here is anecdotal, from industry sources.[10]

▸ 5.1 Phase II Proposal Review Input

Extensive Navy SBIR/STTR-sponsored surveying and interviewing of veteran industry hands in 2007 and 2008 revealed that most primes would like to play an appropriate role in Phase II candidate endorsement and downselection, but—apart from a NAVAIR pilot initiative—they do not see an opportunity to do so. Primes' interest in this issue stems from their investment of time during Phase I in technology and transition planning consultation. To date, best practice regarding Phase II proposal review input by primes consists of informal outreach to the Phase I project TPOC, and to the command and PEO-level SBIR Program Manager, as these government persons are the principal decision-makers on Phase II proposals they have invited from selected Phase I awardees.

What is key to this informal approach to SBIR/STTR selection input is for primes to do three things:

10 | The Navy SBIR Program Office has made systematic efforts to distill best transition practices, from industry's perspective, through interviews and surveys. Key documents include the 2007 Navy SBIR Primes Survey and the 2008 Navy SBIR Best Technology Transition Practices.

- Work with Phase I awardees to ensure viable transition planning and sufficient planning for Phase II partnership that addresses the range of functional needs for technology maturation (e.g., testing facilities).

- Work with the Phase I project TPOC to secure knowledge of the Phase II proposal process timeline and milestones, so that selection input points are accurately identified.

- Work with the command and PEO-level SBIR Program Manager to ensure that selection input is acceptable, and that an input format is approved.

5.2 Phase II Subcontracts

By law and SBA regulation, an SBIR Phase II awardee must perform at least 50% of Phase II work and may subcontract remaining funds. STTR Phase II awardees must perform at least 40% of Phase II work, with their required research partner performing another 30% or more, just as in Phase I, and remaining funds may be subcontracted. With Phase II awards ranging from $750K to >$1M for a two-year effort, depending on DoD or other federal agency, there appears to be a business case for primes' Phase II subcontracting to defray Phase II partnering (man/year and hard cost) effort.

But Navy SBIR 2007-2008 primes' surveys and interviews revealed the opposite: veteran hands said that their experience had been that the SBIR/STTR subcontracting effort itself was just "too much paperwork for too little money" and that given the embedded cost of technology maturation, Phase II awards should be applied in toto to the awardees' project. In lieu of these subcontracts, primes either extend and modify MOUs or LOIs from Phase I, or enact new agreements that spell out partnership guidelines for the Phase II relationship. Periodic SBIR/STTR project need assessments can help inform these agreements.

5.3 Transition/Insertion Planning and Technology Roadmap Sharing

Currently, DoD SBIR/STTR Phase II proposals are required to address in detail the commercialization/transition path for a SBIR/STTR project; although there are significant differences in required transition plan content from agency to agency, and between commands within an agency, these requirements are clearly documented. Although a prime partner's role is not discussed in these documents, it can be decisive for the SBIR/STTR awardee.

Transition plan inputs from four sources are recommended to small firms invited to submit Phase II proposals:

- The SBIR/STTR topic author, available for a 60-day discussion window (see dodsbir.com/sections *Overview-Getting Started*) prior to proposal submission.
- The Phase I project TPOC, if that TPOC is not also the topic author.
- The prime partner for the SBIR/STTR project.
- The agency SBIR Program's transition assistance provider (if any).

A fifth source, a PoR Technology Warrant Holder, is not typically available to a SBIR awardee, although a Warrant Holder is the key decision-maker as regards technology acceptance and the "owner" of relevant technology roadmaps.

Of these five sources, a prime partner often has the most granular insight into the form/fit/function/cost issues that define system/subsystem transition risk for an SBIR/STTR product corresponding to a DoD platform or program opportunity. Prime guidance, based on such insight, can therefore help a SBIR/STTR awardee ensure an explicit, credible transition/insertion plan for a Phase II proposal.

Moreover, such prime guidance will likely provide exposure of the SBIR/STTR awardee to the prime's technology roadmap for a given contracted program, giving the small firm a more practical sense of how an individual SBIR/STTR project fits into a much larger, and complex, technology integration scheme. Technology roadmap exposure resonates with another finding shared by 2007 Navy SBIR surveys of small business, prime and TPOC communities: that small and large firms do not well understand each other's trade space expectations in a dynamic technology integration environment.

5.4 Transition Assistance Programs

Among DoD agencies, transition assistance is provided to Phase II SBIR/STTR awardees by the Air Force, Army, Missile Defense Agency and Navy SBIR programs. Of these four agency programs, Air Force and Army SBIR/STTR transition assistance is limited to their respective Commercialization Pilot Programs (CPP), which are described on their respective websites, www.wpafb.af.mil/library/factsheets *Air Force Small Business Innovation Research* and armysbir.com. The Missile Defense Agency's transition assistance program has both Phase I and II components (but not a CPP initia-

tive) described on its website, www.winmda.com. The Navy, in addition to its CPP effort, also supports a very robust transition assistance program for Phase II awardees, and a pilot Phase I transition assistance program, cited in Section 4 above. These Navy programs, except for the latter, are described on navysbir.com.

Prime partners can access these transition assistance programs in five ways:

- Query their small business partners about awareness and use of these available transition assistance programs.
- Assist small firms in reviewing and assessing content of special transition reports and other information that may be made available.
- Gleaning transition stream details not otherwise known.
- Leverage such information to help its SBIR/STTR partner understand the dynamic technology integration environment for a specific acquisition program.
- Attend special transition-related events, such as the Navy Opportunity Forum or Air Force CCP conferences, associated with these transition assistance programs.

5.5 Transition Tools

Apart from acquisition program and component system technology roadmaps maintained by a prime, the Air Force, Army and Navy are each at varying stages in the process of making available to industry their version of similarly focused roadmaps. In the Navy, for example, Chief Technologist Offices were created in early 2008 at the senior management level in each command, to facilitate management of the Navy Enterprises (for example, Navy Aviation Enterprise) and Provider Enterprises that serve them. Among the CTO functions is to ensure that technology roadmaps are rolled up from the Program Office (PMS-PMA) level through the Program Executive Offices (PEO) and to the SYSCOM level, from which vantage point the roadmaps would be shared by the CTO with industry under carefully managed conditions.

Apart from this high-value transition tool, there are at least three other tools developed by either government or industry to facilitate transition, and subject to continuous modification:

- Technology transition agreements originated in DoD-wide and agency specific programs circa 2005 to aggregate all key players in a transition stream, up to and including technology insertion in a system/subsystem. These so-called TTAs (or equivalent), with their extended Gantt charts to link prospective funding sources with successive technology maturation milestones and responsible authorities, also provide succinct risk information in principal risk areas, and notice approvals of the TTA. The most sophisticated TTAs include industry participation from key primes and/or suppliers, and thereby provide to the prime member of an SBIR/STTR Phase II partnership significant transition information. TTA templates are available from DoD agency and command-level SBIR/STTR Program Managers.

- Risk assessment tools and databases originated with industry and industry consultants looking for a method of continuously measuring and assessing risk factors associated with transition of specific technologies into DoD Program of Record systems and subsystems. While these tools and databases are usually proprietary, most share a number of important features: ability to address the full spectrum of risk category by category, ability to convert recorded data into numeric values, and ability to automatically update the aggregate risk assessment score to determine when a transition project has exceeded a defined risk limit. (See the SPRAT tool in the SBIR/STTR Reference Guide.)

- Project-level quad charts, extensively developed and continuously modified by both government and industry, provide comprehensive but succinct information on a technology project. If regularly updated by a SBIR/STTR Phase II awardee, the quad chart not only helps ensure a shared understanding by both small and large firm partners of a specific integration environment, but also provides a marketing tool that may be used in helping to identify defense applications for a SBIR/STTR product other than the primary customer application.

5.6 Technology Maturation Funding Sources

With allocation of DoD RDT&E funds for technology maturation in decline, and possibly headed for a steeper drop over the next decade, large and small defense firms alike have become careful students of remaining technology maturation programs, and the requirements for accessing them. Generally, these programs are small—rarely funded at >$20M/year—and heavily competed for despite stringent application requirements. In fact, Navy SBIR/STTR-sponsored surveying and interviewing of

veteran industry hands in 2007 and 2008 showed that most primes avoid competing for these funds due to stringent proposal requirements, the small payoff for winners, and the likelihood of losing a competition—expert government advice is therefore highly recommended.

Here are four principal OSD programs, and three principal Navy programs:

▸▸ 5.6.1 OSD Defense Acquisition Challenge Program (DACP)

The purpose is to identify, introduce, test, and procure innovative and cost-saving technology or products from within and outside DoD's S&T community. Proposals are accepted from commands in May only. Funding up to $2M covers a two-year project, for ~ six awards per year. (www.acq.osd.mil/osbp)

▸▸ 5.6.2 OSD Technology Transition Initiative (TTI)

The purpose is to facilitate the rapid transition of new technologies from DoD S&T programs. Proposals are accepted from commands in May only. Funding up to $3M covers a four-year project, for ~four awards per year. (www.acq.osd.mil/osbp)

▸▸ 5.6.3 OSD Foreign Comparative Testing Program (FCT)

The purpose is to test and evaluate foreign non-development, or COTS equipment demonstrated potential to satisfy warfighter and/or warfighter support requirements. Proposals are accepted from commands in May only. Funding up to $2M covers a two-year project, for ~six awards per year. (www.acq.osd.mil/osbp)

▸▸ 5.6.4 OSD Quick Reaction Fund (QRF)

The purpose is to identify and rapidly field-test prototypes that respond to immediate and emerging warfighter needs. Proposals are accepted from commands on a rolling basis. Funding up to $3M covers a one-year project, for ~two awards per year.

▸▸ 5.6.5 Navy Rapid Technology Transition (RTT)

The purpose is to rapidly transition technology into Navy Programs of Record to meet emergent/urgent Navy needs. Proposals are accepted from command CTOs in March only. Funding up to $2M covers ~15 two-year project awards per year. (www.onr.navy.mil)

5.6.6 Navy Technology Insertion Program for Savings (TIPS)

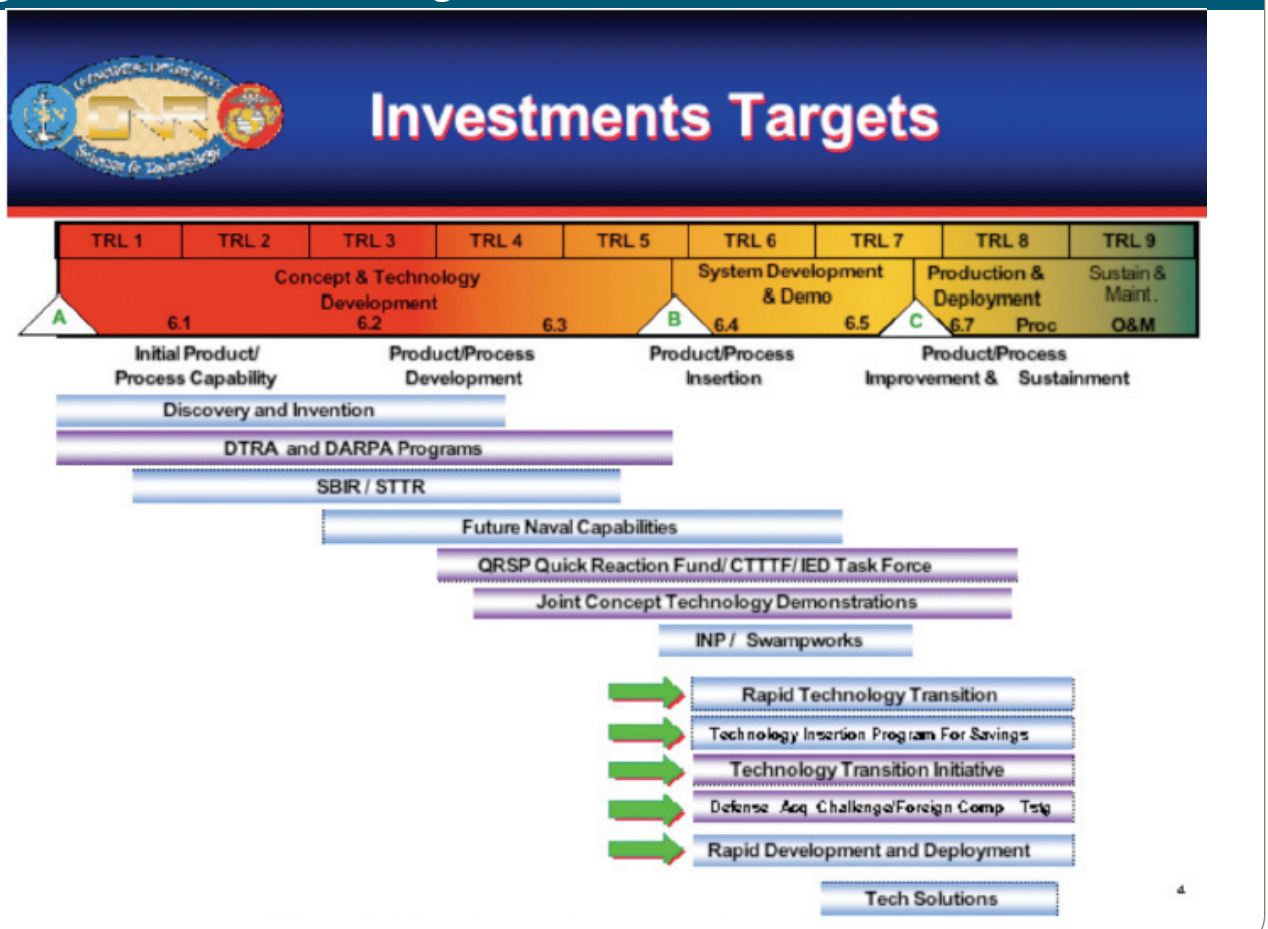
The purpose is to rapidly transition technology into Navy Programs of Record to significantly reduce operations and support costs. Proposals are accepted from command CTOs in March only. Funding up to $2M covers ~15 two-year project awards per year. (www.onr.navy.mil)

5.6.7 Navy Rapid Development & Deployment (RDD)

The purpose is to rapidly develop and field prototype solutions to meet urgent Navy operational needs. Proposals are accepted from CNO N8 on a rolling basis. Funding up to $10M covers ~two one-year project awards per year. (www.onr.navy.mil)

The following graphic shows the relationship of these programs to the defense acquisition framework:

Figure 7 Investments Targets



Source: ONR and OSD Technology Transition Programs; May 2008

In addition to these principal programs, most of the larger DoD agencies have numbers of much smaller, short-term internal S&T funds and programs, which may be identified through an experienced S&T contact in a central research office.

Apart from these special technology maturation funds, primes are familiar with two related advanced technology programs, Navy Manufacturing Technology Program - MANTECH (www.navymantech.com) and OSD Mentor-Protégé Program (www.acq.osd.mil/osbp/mentor_protege), both of which have fiscal leveraging opportunities for established SBIR/STTR partnerships.

In all, the prime contractor interview and survey record shows that large firms appear to have more success in securing funds to mature SBIR/STTR technologies when they can go directly to an acquisition program office with an offer of their own matching funds.

5.7 SBIR/STTR Partnership Metrics, Recordation and Reporting

A prevalent industry slogan is, "measure what you manage, and manage what you measure." While some DoD agency SBIR/STTR Program Offices have increasingly asked primes for transition metric-related data, to assess the health of SBIR/STTR partnering work from a federal perspective, such data has not been required. In fact, legislation authorizing the DoD SBIR Commercialization Pilot Program (CPP) presented the first instance in which defense contractors are required to report on SBIR/STTR activity. (See Section 9: Commercialization Pilot Program, in this document.)

Further, interviews and surveys of prime views on SBIR/STTR practice conducted during 2007-2008 clearly revealed that no prime has a stand-alone SBIR/STTR mining and partnering program, as SBIR and STTR are merely considered one external source of advanced and innovative technologies, albeit an important source. SBIR/STTR activity accords, therefore, with whatever systems engineering procedures prevail in a business unit or group, and is neither managed nor measure separately.

But as primes become more intimate with SBIR/STTR, and its opportunities and unique features, four valuable corporate information and recordation practices are emerging:

- An SBIR/STTR "share point" in the firm's knowledge management system. Such information nodes could import SBIR/STTR training materials and curricula as they are identified.

- Project level management tools, such as quad charts, that provide comprehensive but succinct information on an SBIR/STTR project in an integration context, and double as a marketing tool useful in identifying additional defense applications.

- Program level management tools, such as a multi-category Excel file that captures risk-related information on an SBIR/STTR partnership inventory, so that senior management can monitor the health of SBIR/STTR partnering activity.

- Prime Small Business Office recordation of SBIR/SBIR Phase III contracts, as part of a contractors' overall monitoring of small business activity in accord with Small Business Administration requirements.

5.8 Leveraging State, Regional Funds

Currently, just a handful of states offer Phase II support funding, in each case in the form of competitively awarded matching funds, ranging from $25K to $1M. (See navysbir.com *Phase I-II Support.*)

Section 6.0 | Phase III Activities

COMMENTARY

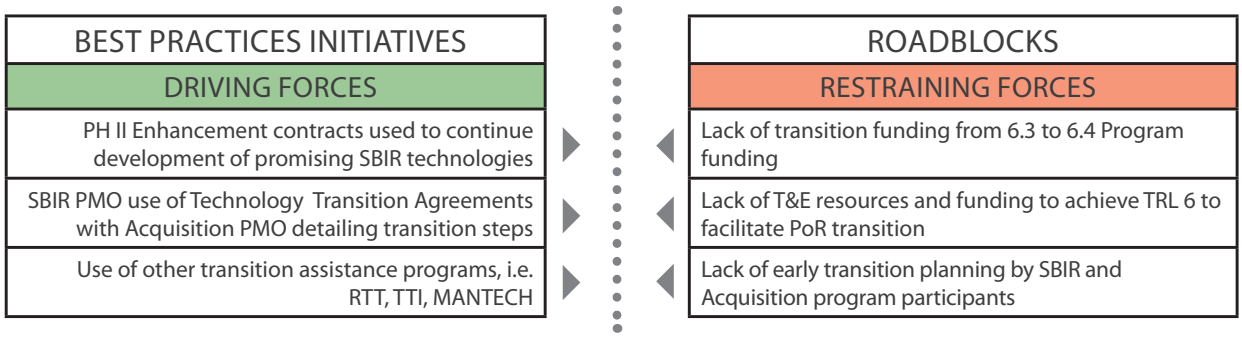
Phase III activities comprise all non-SBIR funded project work[11]—principally, funding to mature, test and demonstrate the SBIR technology, with all of the attendant proposal writing and negotiating.[12] With new DoD agency SBIR efforts highlighting increased technology transition/insertion—witness the Commercialization Pilot Program—early SBIR project investment of time in mining and leveraging federal and state funding resources can result in Phase III payoffs, reduce risk and speed transition. Absent early SBIR project involvement, prime contractors have often found that form/fit/function and test qualification issues with SBIR technologies create significant Phase III obstacles and funding/schedule hurdles.

11 | Given sufficient maturity, a Phase I project could move directly to Phase III, with data rights intact.

12 | Note that the DoD SBIR Commercialization Pilot Program encourages testing and evaluation, normally standard Phase III activities, as early as possible during Phase II to accelerate project maturation.

Figure 8 ▸ Mature and Relevant Technology

Technology must be mature and usable in the context of its proposed application.



Source: A Report on the Navy SBIR Program: Best Practices and Roadblocks; June 2008; p.36

Phase III activities may also include strengthening the SBIR/STTR awardees' core competencies and business functions to improve the likelihood of transition and support the small firm's supplier capability. Moreover, large defense firms have at their disposal a variety of contractual vehicles to directly invest in an SBIR/STTR technology. Finally—as noted above—because the history of DoD agency SBIR/STTR programs is rife with Phase III obstacles, more robust partnerships during Phase II will likely anticipate and mitigate these obstacles.

▸ 6.1 Small Firm Capability Assessment (Risk Mitigation) Available Tools

These assessments and assessment tools focus on managing two vital risk components in SBIR/STTR partnering: technology risk, and risks imposed by limited small firm functionality.

6.1.1 Technology Risk Assessment Tools

While various informal and formal tools are available, the "gold standard" for assessing and managing technology risk is the toolkit known as TRIMS (Technical Risk Identification and Mitigation System), which is solidly rooted in the systems engineering discipline that dominates best transition practice.

TRIMS provides technology transition insight through a knowledge-based tool that measures technical risk management rather than cost and schedule. TRIMS operates as a process-oriented tool based on a systems engineering approach; it identifies key areas of risk, tracks program goals and responsibilities, and can generate a variety of reports to meet a user's needs. TRIMS provides the earliest possible indication of potential problems through process analysis and monitoring, using a suite of simple but effective assessment measures. Early identification of critical data and information that allows the SBIR firm and its partners to anticipate specific risk elements and plan for these in advance can result in prevention and avoidance of cost/schedule problems downstream.

6.1.2 Business Functionality Assessment Tools

Tools in this category focus on assessing a small firm's supplier capability: principally, its ability to manufacture a technology product according to quantity, quality, cost and schedule requirements. While some prime contractors collect such information informally through on-site visits and interviews, others use readily-available web-based "capability audit" tools, or contract-out this work to capability audit specialists that also provide remedial services for small firms lacking appropriate ISO and other certifications, scale-up and related production planning, fiscal planning to support enhanced manufacturing, etc.

Virtually all small business assessment tools derive from a landmark 1983 Harvard Business School publication, including the standard SBC supply maturity graphic at right:

Figure 9 ▸ Supplier Maturity

STARTUP	EXISTENCE	▸ Finding customers ▸ Providing a valuable product or service
	SURVIVAL	▸ Generating a stable cash flow ▸ Hiring additional people to keep up with the work ▸ Developing a structure
GROWTH	SUCCESS	DISENGAGEMENT ▸ Follows a stability strategy ▸ Owner content to sit back and take it easy ▸ Perhaps sell the business GROWTH ▸ Strategic plans for growth and expansion ▸ Hire managers for the future (and for vision)
MATURE	TAKEOFF	▸ How to grow rapidly and finance that growth ▸ Delegation of control to professional managers ▸ Pursuit of vertical & horizontal growth strategies
	MATURITY	▸ Has characteristics of a funcitonal, established firm ▸ How to retail flexibility & entrepreneurial spirit?

Source: Small Business Management: *An Entrepreneurial Emphasis,* Chapter 1, 13th Edition, PowerPoint Presentation by Charlie Cook, The University of West Alabama

But supplier dependability includes assessment of other factors, too, including the less tangible "cultural compatibility" that is often cited by prime contractors as problematic. This is especially true if a small firm lacks experience in the serial, complex steps involved in a systems engineering approach to technology transition.

▸▸ 6.1.3 Combined Assessment Tools

The newest generation of risk assessment tools combines technology and business function assessment by establishing the requisite inquiry fields, assigning numeric values for each field (performed at regular status intervals), and using an algorithm to yield an overall risk rating at predeter-

mined decision gates in the project schedule. If the risk rating exceeds the optimal number linked to a particular decision gate, then due diligence is required to determine the viability of the partnership. Such tools are customized for users to ensure ease of use and alignment with a prevalent business model.

A notable risk management tool devised through the Best Manufacturing Practices Center of Excellence is the *S&T to Production Risk Assessment Tool* (SPRAT), which also uses a weighted approach to provide decision-makers with a high measure of suitability risk upon which to base a support decision.[13]

▸ 6.2 JCTD, DACP, TTI and Other Federal, State and Regional Funding Sources

Federal funding sources to support Phase III work[14] fall into roughly two categories: large programs, particularly Joint Capability Technology Demonstrations and smaller programs. The latter include the seven better-known programs described in Section 5.6 Technology maturation funding sources, above, plus the lesser-known DPA Title III program described below. (It should be noted that there are virtually no state or regional funds for Phase III.)

▸▸ 6.2.1 Joint Capability Technology Demonstration (JCTD)

The JCTD business model of "Try with Intent to Buy" replaced the ACTD model in FY2007 to more rapidly move advanced technology and innovative concepts into the hands of warfighters in the field. Building on the successful ACTD model in which new operational concepts are combined with maturing technologies in a joint environment, JCTDs focus more on tailoring projects to a combatant commander's specifically identified needs, thus emphasizing "needs pull" over historical "technology push."[15] Results metrics reveal that 80% of JCTDs transition at least 50% of their products—special including spiral technologies, if applicable -- to operations with sustainment, within 36 months of JCTD launch.

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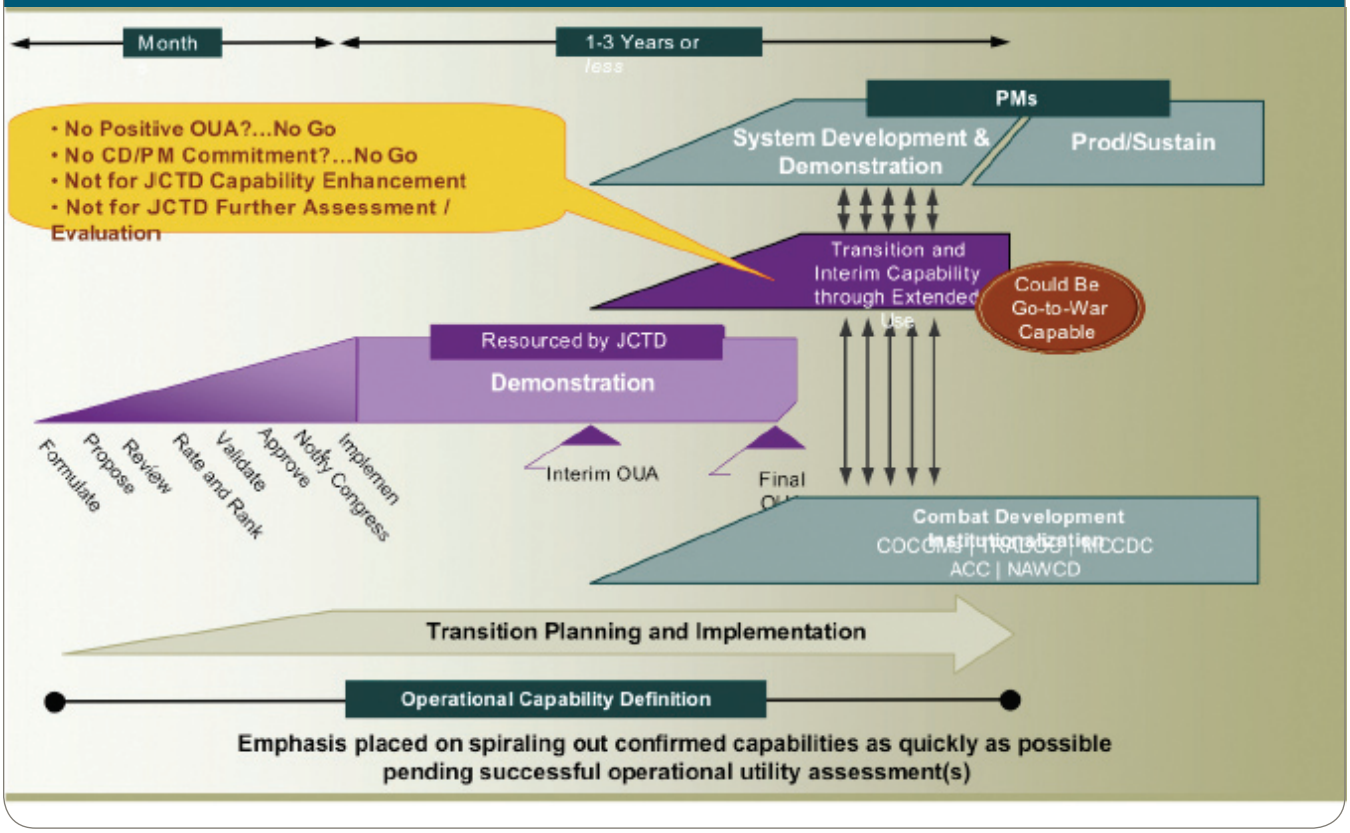
13 | www.bmpcoe.org

14 | Although not strictly compatible with SBIR/STTR support, Future Naval Capabilities (FNC) funding may be considered for innovative technology development. (see http://www.onr.nav y.mil)

15 | 2008 project examples include the Combat Autonomous Mobility System, Hard Target Void-Sensing Fuze, Joint Force Protection Advanced Security System and Multi-Function Threat Detector.

Figure 10 ▸ JCTD Framework



Source: JCTD Practical Operating Guidelines; February 2008

The JCTD Framework is as follows:
A JCTD enables faster project start-up by providing more resources—principally, OSD funding—earlier in the traditional two-year DoD budget cycle and a flexible start process that facilitates urgently needed combatant command-driven capabilities throughout the fiscal year. One key element of the JCTD program is the enhanced transition planning process that seeks to deliver enduring capabilities to the combatant commands (COCOMs). The JCTD program also demands and enables faster fielding of interim capabilities; structures funding to provide incentives for military service and agency participation without requiring the services or agencies to fund from their existing programs; and provides services and agencies clear visibility in their participation of joint efforts. Congressional review is built into the JCTD process.

JCTD funding, ~$200M in FY2007, is competitively awarded within DoD agencies. Prime contractors are not directly eligible; their ability to benefit from JCTD funds is a function of their effective linkage to COCOMs. (www.acq.osd.mil/jctd)

6.2.2 Defense Production Act Title III Program (DPA Title III)

Although DPA Title III funding is rather modest, ~$13M in FY2007, it is usually overlooked in the search for Phase III funds in favor of better-known programs such as Defense Acquisition Challenge described in Section 5.6, above. The mission of DPA Title III is to "create assured, affordable, and commercially viable production capabilities and capacities for items essential for national defense" for high-priority defense needs.[16]

Title III is organized as a DoD-wide program, managed within OSD by the Director of Defense Research and Engineering (DDR&E) with the Air Force as executive agent. Title III funds, made available to industry competitors through annual BAAs issued by OSD, are administered according to DoD Directive 4400.1. A salient requirement of DPA Title III is a commitment by a DoD agency for a guaranteed quantity purchase of advanced materials or technologies targeted by this program.

By stimulating private investment in key production resources, Title III helps to:

- Increase the supply, improve the quality, and reduce the cost of advanced materials and technologies needed for national defense
- Reduce U.S. dependency on foreign sources of supply for critical materials and technologies
- Strengthen the economic and technological competitiveness of the U.S. defense industrial base.

Title III activities serve to lower defense acquisition and life-cycle costs and to increase defense system readiness and performance through the use of higher quality, lower cost, technologically superior materials and technologies (www.acq.osd.mil/ott/dpatitle3).

As noted in Section 5.6, however, the prime contractor interview and survey record shows that large firms appear to have more success in securing funds to mature SBIR/STTR technologies when they can go directly to an acquisition program office with an offer of their own matching funds.

6.3 Phase III Partnering Vehicles

Large defense firms use a variety of contractual vehicles to directly invest in an SBIR/STTR technology, depending on their business models. These

16 | 2008 examples of projects are Atomic Layer Deposition (ALD) Hermetic Coatings, Methanol Fuel Cell Components for Soldier Power, Armor and Structural Transformation: Steel to Titanium, and Lithium Ion Battery Production

include several types of licensing vehicles, purchase of the technology, acquisition of the SBC itself, and hybrid government/industry vehicles such as the Mentor-Protégé program (www.acq.osd.mil). For a comprehensive review of these vehicles from a small firm perspective, see *Business Planning for Scientists and Engineers* (Dawnbreaker Inc., 2008).

6.4 Common Phase III Obstacles

Although study, survey and interview results suggests that negotiation of SBIR/STTR data rights is often an obstacle especially in Phase II partnerships, the same sources suggest that even where data rights issues are resolved, other obstacles dominate Phase III work and hinder the small firm's supplier capability. These include form/fit/function disconnects, cost/schedule disconnects (due to small firm inexperience), military qualification testing, and scale-up problems.

6.4.1 Form/Fit/Function Obstacles

Typically, according to Navy SBIR/STTR study interviews and surveys of both small and large firms, obstacles of this type are attributed to a simple lack of accurate communication of expectations and requirements. The example history shows three varieties of miscommunication:

- Specific Navy technology requirements and associated key performance parameters (KPPs) associated with the POR are not well understood by the small firm.
- Specific form/fit/function information was conveyed by the large firm to the small firm, but either not understood or ignored by the small firm.
- Form/fit/function information conveyed by the large firm was not sufficiently specific or not conveyed in a timely manner to the small firm.

Optimally, this obstacle should be anticipated during Phase II when there is SBIR/STTR project manager in place. The government TPOC must ensure that both small and large firm partners share the same critical information and expectations about requirements, KPPs, etc—although small firms may be confused as to whether government or industry is the more accurate source of such information. During Phase III, the key is to ensure a continuous flow of information back and forth between partners.

6.4.2 Inexperience

Although Navy/industry task forces that focus on improved systems engineering approaches to technology integration date back to Aegis-class

initiatives c.2000, small firms never participate in such dialogues. This is principally because small firm leadership typically do not have advanced systems engineering credentials that is found in prime contractor project managers through special university and Defense Acquisition University curricula and/or on-the-job training.

As a result, according to the relevant interview and survey history, cost/schedule disconnects occur during the Phase III segment of SBIR/STTR partnerships due to the lack of understanding by small firms of the large firm's systems engineering framework in a specific segment, operating group or line of business within that group. While the large firm socializes this framework internally through complex, myriad-cell tables that parallel the Defense Acquisition Framework, such vital information is not generally shared.

6.4.3 Testing Adequacy

Qualification of technologies for military applications requires rigorous testing protocols, often necessitating specialized equipment. These protocols are generally well understood by the primes, but not by most small businesses. It is imperative that the primes provide such testing guidance to the SBC as early as practical to meet SBIR/STTR project schedule planning requirements. The key is, "the right expert at the right time."

6.4.4 Scale-Up Obstacles

A common complaint voiced by small firm CEOs who have scaled-up operations to support manufacturing is, "I wish someone had explained this to me earlier." Adequate planning to finance and obtain the necessary equipment, certifications and skills to become a dependable, quality supplier is daunting for a small firm with a "sell-your-science" history of limited functionality. However, developing a manufacturing capability is not a Phase III task for a SBIR/STTR partnership, given a ~five year transition horizon.

The Phase III obstacle is more nuanced: the Navy SBIR/STTR interview and survey history cites repeated instances in which the large firm partner, while it did conduct on-site and other audits to assess Manufacturing Readiness Levels and other supplier capabilities, did not delve deep enough to ensure that a full range of required certifications resided with the small firm or that a Quality Assurance plan was both sufficient and implemented. These shortcomings, emerging as late as Phase III, will have negative consequences.

In some cases, although the capability assessment tools were adequate, the large firm assessor failed to present a complete audit or was too inexperienced to do so. In other instances, more subjective but still critical elements were not assessed. For example, whether or not the small firm had sufficient core leadership to guide a scaled-up operation and had access to fiscal resources adequate to remedy deficiencies.

Section 7.0 | Understanding Readiness Levels

Core Documents and Links from the SBIR/STTR Reference Guide

- DoD Manufacturing Technology: www.dodmantech.com
- MRA link to DAU CoP
- Contains Manufacturing Readiness Level Definitions, MRLs and Assessments Guides, and Manufacturing Readiness Tutorial
- TRA Deskbook: www.dod.mil/ddre/doc/tra_deskbook.pdf

MRLs contained in Appendix I

- DAU PQM Community of Practice acc.dau.mil/pqm
- Manufacturing Readiness folder
- MRLs, Questions, Exit Criteria, Tutorial
- Best Manufacturing Practices Center of Excellence: www.mrlassist.bmpcoe.org
- MRL Assist web-based tool

COMMENTARY

Tasked in 1982 with addressing improvement of DoD materiel acquisition, the Defense Science Board formed a task force to more clearly define and accelerate the transition from development to production. The 47 engineering discipline and logistics templates that emerged—the *Willoughby Templates*—became a DoD risk management baseline from which later technology assessment and process improvement tools are derived.

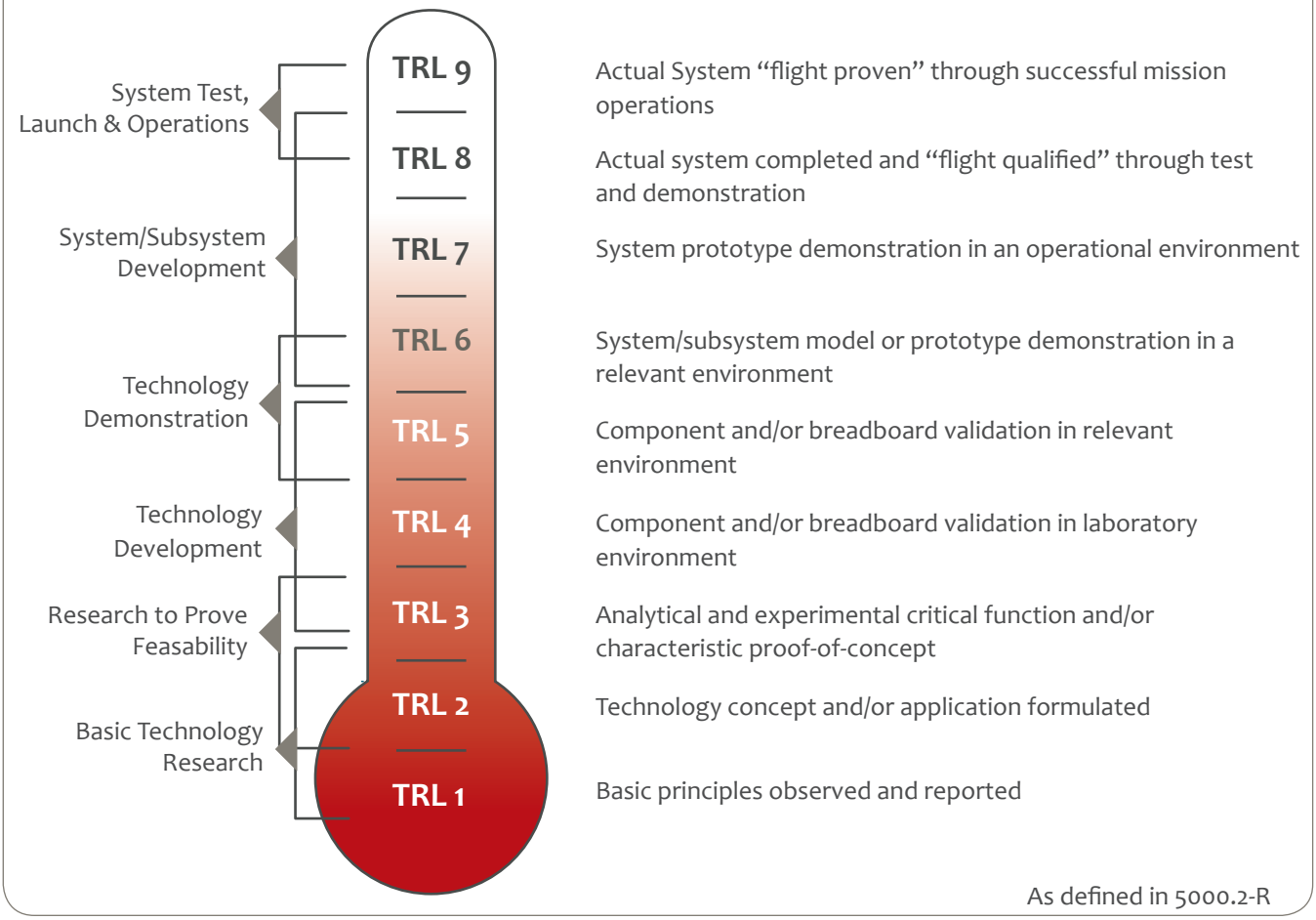
NASA's parallel technology risk management initiative produced the Technology Readiness Level (TRL) scale, formalized in 1989, that came to DoD's attention in concert with the defense government/industry working group on systems engineering innovation to improve acquisition. GAO highlighted the value of TRL assessment in its 1999 study, *Maturity of Technology at Program Start is an Important Determinant of Success.*

DoD, which had in 2001 tasked its Joint Defense Manufacturing Technology Panel to form a Manufacturing Readiness Level working group, merged TRLs into required acquisition practice in 2002 via DoD Instruction 5000.2-R. Simultaneously, DoD began pilot efforts with the Transition Commitment Level (TCL), Capability Maturity Level (CML) and other process improvement frameworks. With Readiness Levels now woven into DoD's process improvement construct, the next task in refining Readiness Levels is to reduce subjectivity in assigning levels. This is to be followed by inclusion of these in the current (2003) DoD 5000.2 Instruction, Operation of the Defense Acquisition System—as GAO recommended of MRLs in its key 2006 study (GAO 06-883), *Stronger Practices Needed to Improve DoD Technology Transition Processes.*

7.1 Technology Readiness Levels - TRL

Although NASA experiments with TRL definitions to improve technology insertion date back to the late 1970's, NASA formalized the TRL scale and its use in 1989. When TRL use was formally adapted to DoD process improvement through the DoD Instruction 5000.2-R in 2002, the DoD TRL was succinct, but somewhat general (see below).

Figure 11 ▸ Measuring Technology Maturity | Technology Readiness Levels



As defined in 5000.2-R

With TRL implementation and experience in use in DoD acquisition programs, the scale was soon elaborated through introduction of complementary hardware and software versions, with definitions sharpened to reduce subjectivity in assignment of a specific TRL.

Individual DoD agencies introduced further refinements, such as the Air Force "TRL Calculator", a Microsoft Excel spreadsheet application designed to make the TRL scale a more robust and accurate risk management tool.[17] A DoD-wide TRL Calculator V.2.2, based on the Air Force model, is available through the Defense Acquisition University. (acc.dau.mil/community-browser) A current Army TACOM Life Cycle Management Command version of the TRL scale, shown below, shows expanded secondary definitions.

Figure 12 ▸ TRL Scale Developed by U.S. Army TACOM

TRL	DESCRIPTION
1 Basic principles observed and reported	Lowest level of technology readiness. Scientific research begins to be translated into applied reserch and development. Examples might include paper studies of a technology's basic properties.
2 Technology concept and/or application formulated	Invention begins. Once basic principles are observed, practical applications can be invented. Applications are speculative and there may be no proof or detailed analysis to support the assumptions. Examples are limited to analytic (paper) studies.
3 Analytical and experimental critical function and/or characteristic proof of concept	Active research and development is initiated. This includes analytical studies and laboratory studies to physically validate analytical predictions of separate elements of the technology. Examples include components that are not yet integrated or representative.
4 Component and/or breadboard validation in laboratory environment	Basic technological components are integrated to establish that they will work together. This is relatively "low fidelity" compared to the eventual system. Examples include integration of "ad hoc" hardware in the laboratory.
5 Component and/or breadboard validation in relevant environment.	Fidelity of breadboard technology increases significantly. The basic technological components are integrated with reasonably realistic supporting elements so it can be tested in a simulated environemnt. Examples include "high fidelity" laboratory integration of components.
6 System/subsystem model or prototype demonstration in a relevant environment	Representative model or prototype system, which is well beyond that of TRL 5, is tested in a relevant environment. Represents a major step up in a technology's demonstrated readiness. Examples include testing a prototype i a high-fidelity laboratory environment or in simulated operational environment.

17 | William Nolte – AFRL; "The TRL Calculator"; NDIA Systems Engineering Conference; October 2003

TRL	DESCRIPTION
7 System prototype demonstration in an operational environment	Prototype near, or at, planne doperational system. Represents a major step up from TRL 6, requiring demonstration of an actual system prototype in an operational environment such as an aircraft, vehicle, or space. Examples include testing the prototype in structured or actual field use.
8 Actual system completed and qualified through test and demonstration	Technology has been proven to work in its final form and under expected operational conditions. In almost all cases, this TRL represents the end of true system development. Examples include developmental test and evaluation of the system in its intended or pre-production configuration to determine if it meets design specifications and operational sustainability.
9 Actual system proven through successful mission operations	Actual applicaiton of the technology in its production configuration and under mission conditions, such as those encountered in operational test and evaluation. Examples include using the system by operational users under operational mission conditions.

Figure 13 ▸ TRL Scale by DoD Budget Activity Level

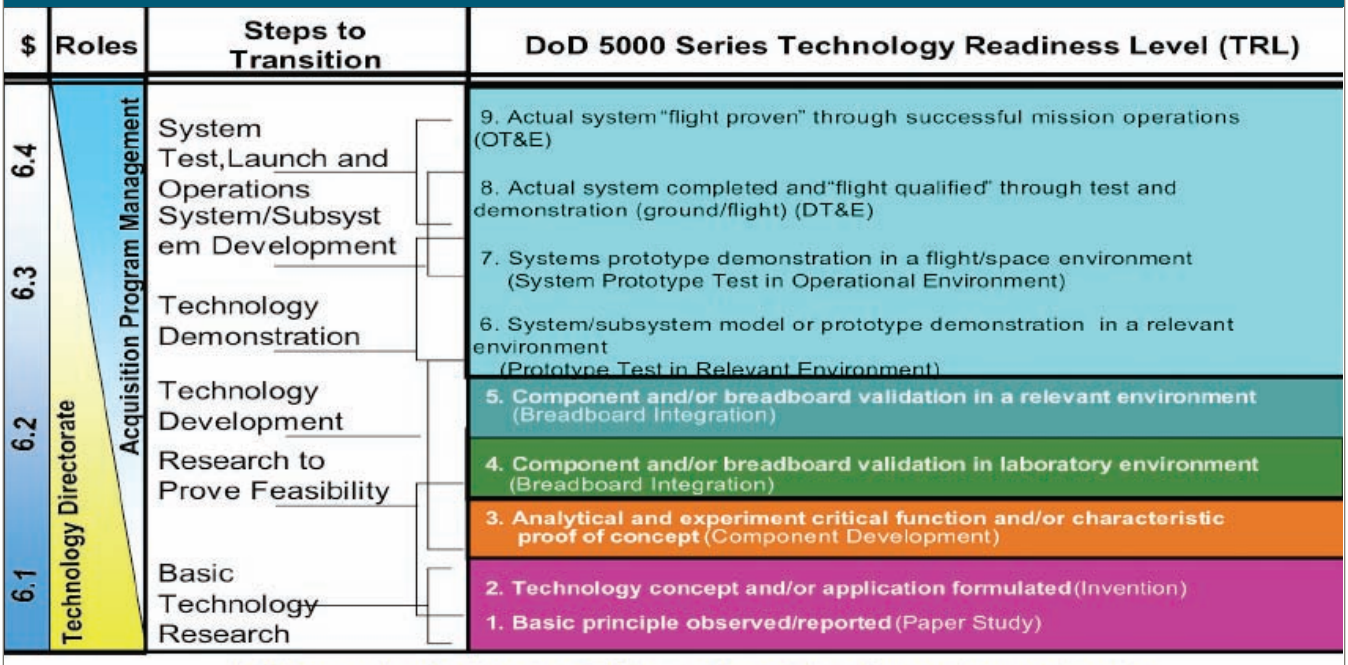


Figure 13 ▸ A current Office of Naval Research version, shown above, depicts the TRL scale by DoD Budget Activity Level and refers to the forthcoming use of Transition Commitment Levels (TCL), described in Section 7.3:

7.2 Manufacturing Readiness Levels – MRL

The following table presents a current version of the MRL tool:

Figure 14 ▸ Manufacturing Readiness Level Tool

MRL	DEFINITION	DESCRIPTION	PHASE
1	Manufacturing Feasibility Assessed	This is the lowest level of manufacturing readiness. The focus is on a top level assessment of feasibility and manufacturing shortfalls. Basic manufacturing principles are defined and observed. Begin basic re-search in the form of studies (i.e. 6.1 funds) to identify producibility and material solutions.	Pre Concept Refinement
2	Manufacturing Concepts Defined	This level is characterized by developing new manufacturing approaches or capabilities. Applied Research translates basic research into solutions for broadly defined military needs. Begin demonstrating the feasibility of producing a prototype product/component with very little data available. Typically this is applied research (i.e. 6.2) in the S&T environment and includes identification and study of material and process approaches, including modeling and simulation.	Pre Concept Refinement
3	Manufacturing Concepts Developed	This begins the first real demonstrations of the manufacturing concepts. This level of readiness is typical of technologies in the S&T funding categories of 6.2 and 6.3. Within these levels, identification of current manufacturing concepts or producibility has occurred and is based on laboratory studies. Materials have been characterized for manufacturability and avail-ability but further evaluation and demonstration is required. Models have been developed in a lab environment that may possess limited functionality.	Pre Concept Refinement
4	Capability to produce the technology in a laboratory environment.	Required investments, such as manufacturing technology development identified. Processes to ensure manufacturability, producibility and quality are in place and are sufficient to produce technology demonstrators. Manufacturing risks identified for prototype build. Manufacturing cost drivers identified. Producibility assessments of design concepts have been completed. Key Performance Parameters (KPP) identified. Special needs identified for tooling, facilities, material handling and skills.	Concept Refinement (CR) leading to a Milestone A decision.

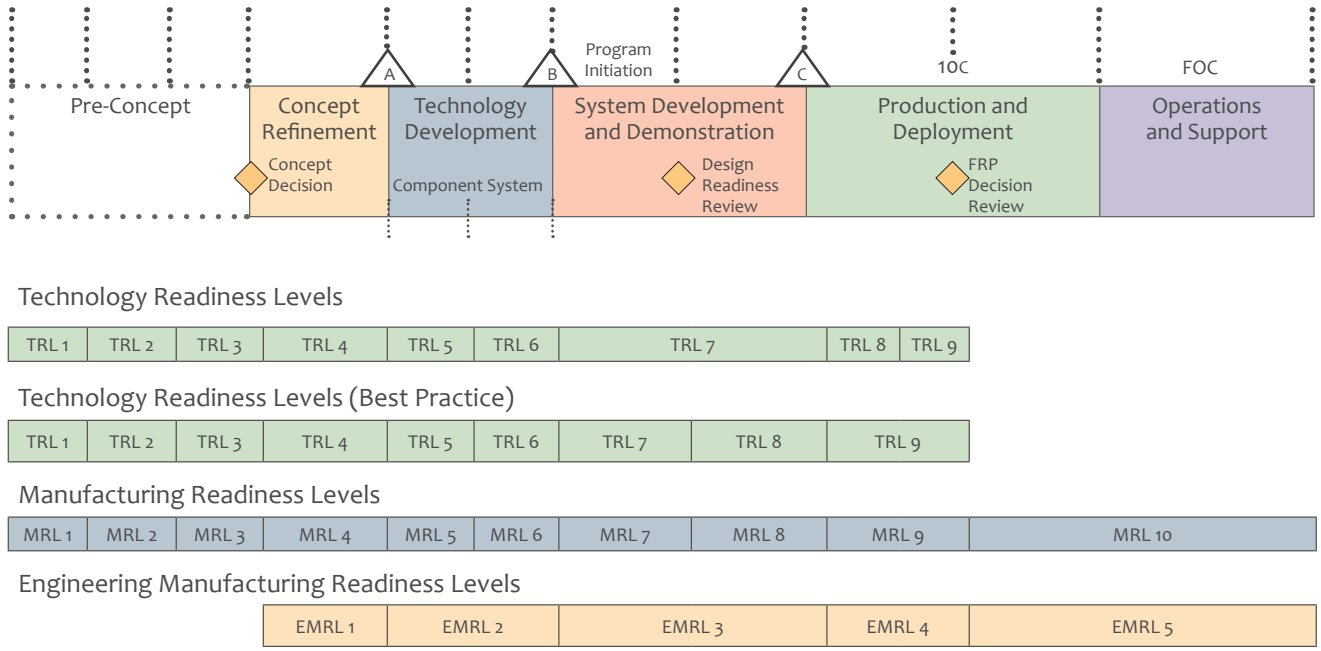
MRL	DEFINITION	DESCRIPTION	PHASE
5	Capability to produce prototype components in a production relevant environment.	Mfg strategy refined and integrated with Risk Mgt Plan. Identification of enabling/critical technologies and components is complete. Prototype materials, tooling and test equipment, as well as personnel skills have been demonstrated on components in a production relevant environment, but many manufacturing processes and procedures are still in development. Manufacturing technology development efforts initiated or ongoing. Producibility assessments of key technologies and components ongoing. Cost model based upon detailed end-to-end value stream map.	Technology Development (TD) Phase.
6	Capability to produce a prototype system or subsystem in a production relevant environment.	Initial mfg approach developed. Majority of manufacturing processes have been defined and characterized, but there are still significant engineering/design changes. Preliminary design of critical components completed. Producibility assessments of key technologies complete. Prototype materials, tooling and test equipment, as well as personnel skills have been demonstrated on subsystems/ systems in a production relevant environment. Detailed cost analysis includes design trades. Cost targets allocated. Producibility considerations shape system development plans. Long lead and key supply chain elements identified. Industrial Capabilities Assessment (ICA) for MS B completed.	Technology Development (TD) phase leading to a Milestone B decision.
7	Capability to produce systems, subsystems or components in a production representative environment.	Detailed design is underway. Material specifications are approved. Materials available to meet planned pilot line build schedule. Manufacturing processes and procedures demonstrated in a production representative environment. Detailed producibility trade studies and risk assessments underway. Cost models updated with detailed designs, rolled up to system level and tracked against targets. Unit cost reduction efforts underway. Supply chain and supplier QA assessed. Long lead procurement plans in place. Production tooling and test equipment design & development initiated.	System Development & Demo (SDD) leading to Design Readiness Review (DRR).

MRL	DEFINITION	DESCRIPTION	PHASE
8	Pilot line capability demonstrated. Ready to begin low rate production.	Detailed system design essentially complete and sufficiently stable to enter low rate production. All materials are available to meet planned low rate production schedule. Manufacturing and quality processes and procedures proven in a pilot line environment, under control and ready for low rate production. Known producibility risks pose no significant risk for low rate production. Engineering cost model driven by detailed design and validated. Supply chain established and stable. ICA for MS C completed.	System Development & Demo leading to a Milestone C decision.
9	Low Rate Production demonstrated. Capability in place to begin Full Rate Production.	Major system design features are stable and proven in test and evaluation. Materials are available to meet planned rate production schedules. Manufacturing processes and procedures are established and controlled to three-sigma or some other appropriate quality level to meet design key characteristic tolerances in a low rate production environment. Production risk monitoring ongoing. LRIP cost goals met, learning curve validated. Actual cost model developed for FRP environment, with impact of Continuous improvement.	Production & Deployment leading to a Full Rate Production (FRP) decision
10	Full Rate Production demonstrated and lean production practices in place.	This is the highest level of production readiness. Engineering/design changes are few and generally limited to quality and cost improvements. System, components or items are in rate production and meet all engineering, performance, quality and reliability requirements. All materials, manufacturing processes and procedures, inspection and test equipment are in production and controlled to six-sigma or some other appropriate quality level. FRP unit cost meets goal, funding sufficient for production at required rates. Lean practices well established and continuous process improvements ongoing.	Full Rate Production/ Sustainment

Source: "DoD Managers Guide to Technology Transitions in an Evolutionary Environment, Version 1.0"; January 2003

The following graphic describes the operational relationship between TRLs and MRLs from the Navy MANTECH program perspective, with Engineering Manufacturing Readiness Levels (EMRL) included to help capture related design knowledge needs:

Figure 15 ▸ Defense Acquisition Life Cycle Framework



Source: Defense Acquisition University; Acquisition Community Browser; March 2008

EMRLs, as described in the DoD Defense Acquisition Guidebook, are focused on specific criteria and metrics to capture the design and manufacturing knowledge necessary to enter System Integration and Demonstration (Milestone B) and Production (Milestone C) phases of defense acquisition work.

To help ensure MRL congruence with TRL designation, the Joint Defense manufacturing Technology Council tasked the Best Manufacturing Practices Center of Excellence in 2006 with developing a Manufacturing Readiness Assessment (MRA) tool, "MRL Assist", now in common use.[18]

▸ 7.3 Transition Commitment Levels - TCL

As noted above, the Navy Office of Naval Research pioneered the development and usage of the TCL scale as a process improvement and risk management complement to TRLs and MRLs for its Future Naval Capabilities (FNC) projects.

18 | Available in DoD Manufacturing Readiness Levels and Assessments Guide (August 2006) at www.bmpcoe.org

Figure 16 ▸ Transition Commitment Level (TCL)

Strength of Transition Commitment \ Years remaining in approved S&T development program	1	2	3	4	5+
A **TTA Level A - Committed** Fully executed final TTA including integration strategy. Transition funding programmed.	A1	A2	A3	A4	A5
B **TTA Level B - Working** Detailed Exit Criteria. Acquisition Program interested. Transition TRL established. Proposed Transition Budget, PE Line Identified/targeted	B1	B2	B3	B4	B5
C **TTA Level C - Initial** Initial Exit Criteria. Target Acquisition Program Identified and Program Manager is watching with interest as technology is developed. PE Line identified/targeted. Key stakeholders identified.	C1	C2	C3	C4	C5
D **No TTA** IPT and TOG commitment.	D1	D2	D3	D4	D5

Source: Office of Naval Research; Naval S&T Futures Overview; April 2006

Subsequently, OSD adopted the TCL scale as a contribution to decision-making process improvement in the DoD-wide Joint Capability Technology Demonstration (JCTD) program, described in Section 6.2.1, above. With most DoD agencies now committed to executing more formal Technology Transition Agreements (TTAs) to ensure advanced technology insertion, the increased use of the TCL scale should be expected.

▸ 7.4 Other Process Improvement Tools; Capability Maturity Levels (CML)

The Capability Maturity Model (CMM), which includes a CML, was first developed by industry. It is a framework that describes effective process elements that promote process improvement. The CMM describes an evolutionary improvement path from an immature process to a mature process across five levels of progressive process maturity, and indicates the Generic Practices that are addressed at each level.

The CMM covers practices for planning, engineering and managing development and maintenance activities. When followed, these key practices improve the ability of organizations to meet goals for cost, schedule, functionality and product quality. The goal is to improve efficiency, return on investment and effectiveness. CMM establishes a yardstick against which it is possible to judge, in a repeatable way, the maturity of an organization's process and compare it to the state of the practice in industry. CMM is also used to identify process improvement needs, to plan and prioritize improvements and to evaluate improvement progress.

Figure 17 ▸ Capability Maturity Levels (CMLs)

CAPABILITY LEVEL	GENERIC GOALS (GG)	GENERIC PRACTICES (GP)
5 ▸ Optimizing	Institutionalize an Optimizing Process	▸ Ensure continuous process improvement ▸ Correct common cause of problems
4 ▸ Quantitatively Managed	Instutionalize a Quantitatively Managed Process	▸ Establish quality objectives ▸ Stabalize subprocess performance
3 ▸ Defined	Institutionalize a Defined Process	▸ Establish a defined process ▸ Collect improvement information
2 ▸ Managed	Institutionalize a Managed Process	▸ Establish org. policy ▸ Plan the process ▸ Provide resources ▸ Assign Responsibility ▸ Train people ▸ Perform managed process ▸ Manage configurations ▸ Monitor & control the process ▸ Objectively verify adherence ▸ Review status with management ▸ Identify & involve relevant stakeholders
1 ▸ Performed	Achieve Specific Goals	▸ Identify work scope ▸ Perform base practices
0 ▸ Incomplete	None	▸ None

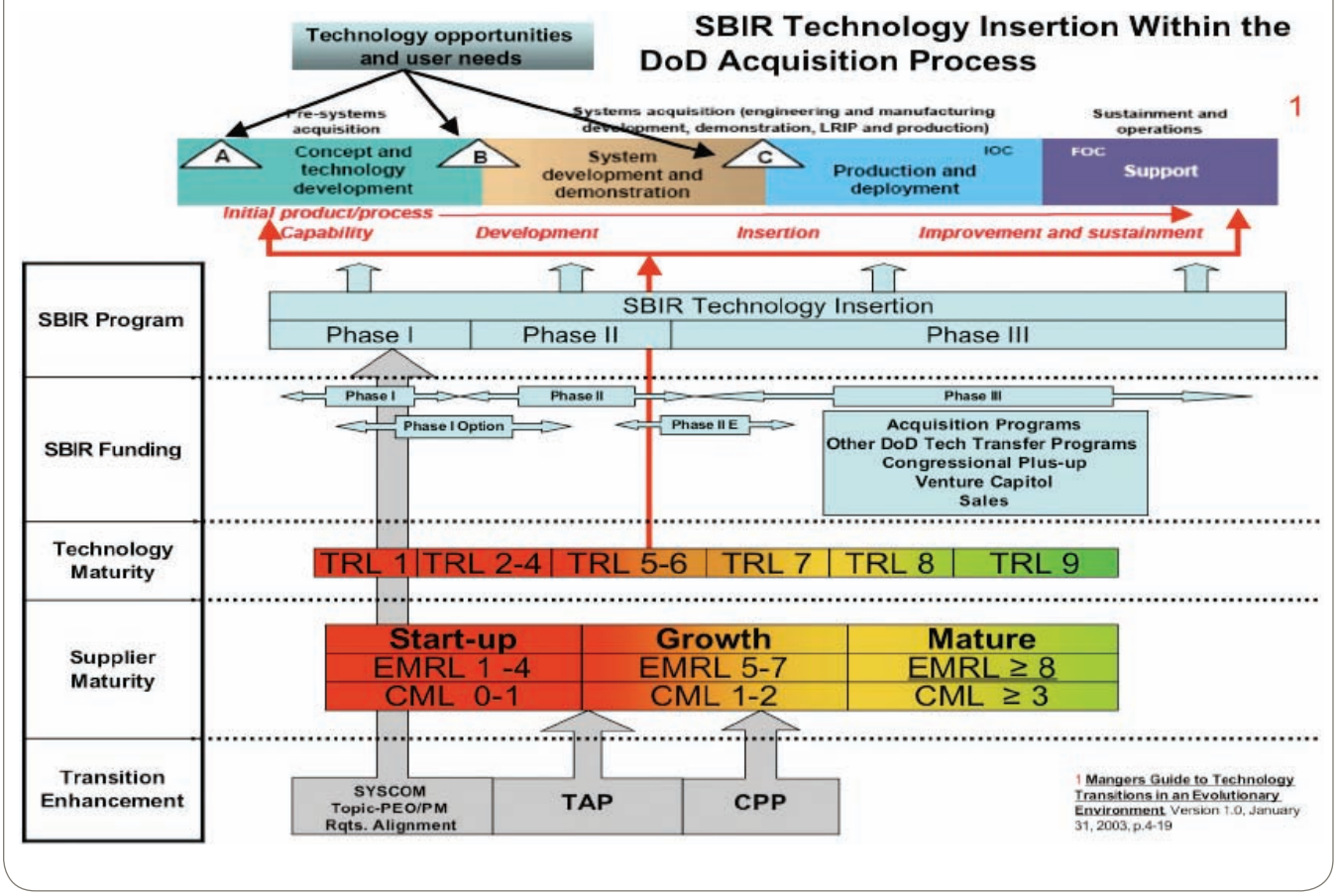
Source: Carnegie Mellon Software Engineering Institute

"The CMM covers practices for planning, engineering and managing development and maintenance activities. When followed, these key practices improve the ability of organizations to meet goals for cost, schedule, functionality and product quality. The goal is to improve efficiency, return on investment and effectiveness. CMM establishes a yardstick against which it is possible to judge, in a repeatable way, the maturity of an organization's process and compare it to the state of the practice in industry."

7.5 SBIR Roadmap with all Readiness Level Tools

The following graphic references all of the above Readiness Level tools in describing SBIR technology insertion as a function of the Defense Acquisition Framework:

Figure 18 Readiness Level Tools



Section 8.0 | Searching SBIR/STTR Inventories

COMMENTARY

Over its 25-year history, the DoD SBIR/STTR program has amassed an innovation inventory in excess of 59,000 awarded projects addressing a wide range of defense and security technology needs, and potentially capable of meeting other government and private sector needs. Although visitation audits of the various DoD SBIR/STTR "search awards" websites show considerable search activity, surveys and interviews in one key community of interest—defense prime contractors—reveal that these databases may lack enough essential information to support even preliminary decision-making. The purpose of this section is to present a succinct situational report on searching SBIR/STTR inventories.

▸ 8.1 DoD Agency SBIR/STTR Agency Public Database Comparison

Within DoD, an all-agencies SBIR/STTR database is centrally maintained; service-specific SBIR/STTR databases are also maintained by the Air Force, Army and Navy SBIR/STTR Program Offices. These databases vary somewhat by search capabilities, content, and timeliness of entries. Each is accessible by the public and contains no classified or proprietary information.

▸▸ 8.1.1 DoD All-Agencies SBIR/STTR Database

This awards inventory is supported by OSD Office of Small Business Programs at www.acq.osd.mil/osbp/sbir. The database, which replicates data appearing in the separate Air Force, Army and Navy databases, is also a unique source of SBIR/STTR award data for the additional 11 DoD agencies with SBIR/STTR programs. Its search engine accepts key word or proposal title inputs. This awards database has content limited to proposal abstracts and basic project identifiers. Although the database is updated quarterly, some smaller DoD agency SBIR/STTR programs report up data less frequently. A companion database on the same website caches non-DoD SBIR/STTR awards.

▸▸ 8.1.2 Air Force SBIR/STTR Database

This awards inventory, the "Technology Mall", is supported by the Air Force SBIR/STTR Program Office at www.sbirsttrmall.com. This database has award/project content beyond what is offered in the DoD all-agencies inventory, specifically including Phase I-II reports and transition summaries. Its search engine accepts various inputs: Firm, DoD Technical Area, Government Managing Office, Government Sponsoring Office, Agency and Keyword.

8.1.3 Army SBIR/STTR Database

This awards inventory is supported by the Army SBIR/STTR Program Office at www.armysbir.com/awards. This database cites current and past awards by topic and title only, and lacks a search engine that accepts key word or other inputs. As Army SBIR helps manage the DoD Chemical and Biological Defense (CBD), this database includes CBD SBIR award information, plus a small number of awards it co-manages with the Missile Defense Agency.

8.1.4 Navy SBIR/STTR Database

This awards inventory is supported by the Navy SBIR/STTR Program Office at www.navysbir.com/awards. This especially robust database (with >11,200 projects) has award/project content beyond what's offered in the DoD all-agencies inventory, specifically including Phase I-II proposal abstracts and project summaries, Phase III awards, success stories, and comprehensive technology, transition and business assessment files for those SBIR/STTR firms who have participated in the Navy Transition Assistance Program (TAP). Its search engine accepts various inputs: Keyword, Topic Number, Firm, State or Zip Code, and Award End Date. The database also cites awards for topics developed jointly with the Missile Defense Agency.

The Navy SBIR/STTR website itself is in the process of mounting a number of searchable documents on SBIR/STTR, including an SBIR/STTR reference guide, training materials, the 2008 Navy SBIR/STTR Best Practices Report, and 2008 Defense Contractors SBIR/STTR Partnering Manual.

8.2 Searching the Navy SBIR/STTR Database – Special Features

The Navy SBIR Program Office has continuously experimented with SBIR/STTR awards database improvements since 2001, to facilitate identification of possible technology solutions by government and industry customers. In 2006, the Navy SBIR Director decided to significantly enhance the capability of the awards database by transforming its search mechanism from a typical relational process to a concept-based "spidering" process that permits instant querying of various complementary databases containing patent, financial, basic science and other information of potential value to government and industry customers as they pursue due diligence on SBIR/STTR candidates.

8.3 Other Federal and Commercial SBIR/STTR Search Products

While several non-DoD SBIR/STTR programs maintain databases, the official government-wide SBIR/STTR database is TECH-Net, hosted by the Small Business Administration. In addition to these federal sources, there are numerous commercial sites, of which three high-visibility sites are listed below.

8.3.1 Small Business Administration TECH-Net

This is the official federal government SBIR/STTR database. TECH-Net is an electronic gateway of technology information and resources for and about small high tech businesses. It is a search engine for researchers, scientists, state, federal and local government officials, a marketing tool for small firms and a potential "link" to investment opportunities for investors and other sources of capital. It is a free service for those seeking small business partners, small business contractors and subcontractors, leading-edge technology research, research partners (small businesses, universities, federal labs and non-profit organizations), manufacturing centers and investment opportunities.

Businesses profiled on the TECH-Net system can be searched by a variety of data elements such as: location; company name, phase, agency, branch, award year, etc. The system is also linked to technology sources of information, assistance and training. The TECH-Net project is a cooperative effort among SBA's Offices of Technology and the Chief Information Officer.

- Plus Factors: The data search engine has a wide variety of search options for creating reports and finding data from many fields.

- Minus Factors: The data is not up-to-date, and can lag up to three years behind completed SBIR/STTR project work.

8.3.2 Zyn Online

This commercial site is hosted by Zyn Systems, Inc. at zyn.com. The site presents a number of databases (not award-based) with varied SBIR/STTR information including a comprehensive SBIR/STTR events calendar, and provides links to every official government SBIR/STTR database.

8.3.3 Dawnbreaker Online

This commercial site is hosted by Dawnbreaker, Inc. at dawnbreaker.com. The site presents a deep and rich variety of information on defense tech-

nology transition and on numerous SBIR/STTR Phase II projects participating in the Navy Transition Assistance Program (TAP) and annual Navy Opportunity Forum. Tutorials are presented on key relevant transition issues, and the site additionally presents information on non-DoD SBIR/STTR programs supported by Dawnbreaker.

- Plus Factors: The site is deeply informative on Navy SBIR/STTR TAP projects and selected defense technology transition issues. The search engine for the site's *Virtual Acquisition Showcase* has a wide variety of search options for find technology and business information.

- Minus Factors: The site is not inclusive of Navy SBIR/STTR projects beyond those that have participated in TAP, and much of the site is either not open to the public or requires site registration for use.

8.3.4 In-Know-Vation Online

This commercial site is hosted by the Innovation Development Institute at inknowvation.com, and specifically presents an SBIR/STTR awards database. Most of this awards database is free of charge but site registration is required. There is also a paid subscription service for those who require access to the more detailed information areas of this comprehensive SBIR/STTR awards database.

- Plus Factors: The most comprehensive and up-to-date SBIR awards database available. The data search engine has a wide variety of search options.

- Minus Factors: Complex web site and interface requires thought and understanding to harness its power. Registration is required even for free access.

Section 9.0 | Commercialization Pilot Program (CPP)

9.1 Baseline Legislation and Policy

The DoD SBIR Commercial Pilot Program (CPP), supported through FY2009 by Section 252 of the National Defense Authorization Act of FY2006 (Public Law 109-163), significantly amends SBIR as codified i 15 USC 638, with emphasis on defense technology commercialization:

- Authorizes SECDEF to create CPP and identify SBIR research programs that have potential for rapid transition and meet high priority requirement.
- Requires involvement of PEOs and program managers in SBIR topic development, and Phase III transition planning and approval.
- Allows use of 1% of SBIR funds for CPP administration.
- Requires annual reporting of CPP activities by PEOs, program managers and prime contractors.
- Ties Executive Order 13329, which encourages manufacturing innovation, into SBIR law.
- Allows for testing and evaluation work in Phases I and II.

Congressional intent in creating the CPP is to accelerate the transition of technologies, products, and services developed under SBIR to Phase III and into the acquisition process. In carrying out the CPP, SECDEF and the Secretary of each Military Department are required to identify SBIR research programs that have the potential to transition rapidly to Phase III and into the acquisition process. The Secretary of the Military Department concerned must certify in writing that, with respect to the selected programs, the successful transition of the program to Phase III and into the acquisition process is expected to meet high priority military requirements of the MILDEP.

SECDEF is required to submit an evaluative CPP report to the Committee on Armed Services and the Committee on Small Business Entrepreneurship of the U. S. Senate, and the Committee on Armed Services and the Committee on Small Business of the U. S. House of Representatives, at the end of each fiscal year. The report is to include (1) an accounting of the funds used in the CPP; (2) a detailed description of the CPP, including incentives and activities undertaken by acquisition program mangers, program executive officers and prime contractors; and (3) a detailed compilation of results achieved by the CPP, including the number of small business concerns assisted and the number of projects commercialized. A CPP report filed for FY2007 also had FY2006 information.

9.2 DoD Agency CPPs Compared: A Structure and Functions Summary

While the CPP authorizing legislation limited program development to the Air Force, Army and Navy, subsequent DoD implementation directives appeared to open the door to DoD agencies to participate voluntarily. To date, however, only the three military departments maintain CPP efforts.

9.2.1 Air Force SBIR CPP

The Air Force has implemented a CPP initiative that directly links PEO representatives to Air Force Research Laboratory TPOCs to generate topics that are of high interest to Air Force product centers. Successful implementation of this process occurred during FY06-07. This technology-based needs-gathering process is ongoing, translating the product center technology needs into SBIR topics using CPP "Transition Agents", and resulting in optimal use of SBIR funds.

A parallel five-step CPP initiative matches up product center prime/supply chain contractors with SBIR Phase II firms working in areas relevant to the product centers' technology needs: (1) Industry selects small businesses to interview from data mined SBIR Phase II projects. (2) These companies are invited to participate in an Air Force/Industry Technology Interchange Workshop. (3) Transition agents contact participating prime/supply chain contractors to identify which small businesses share areas of mutual interest and are a potential partner. (4) Transition agents re-engage with the corresponding product center that initiated the need and the TPOC that manages the SBIR project upon confirming a new teaming arrangement. (5) All stakeholders enter into an agreement, the SBIR Technology Transition Plan (STTP). The STTP identifies the roles and responsibilities of the stakeholders as well as assistance required by the small business to achieve a Phase III project.

The latter approach was pioneered in 2007 and refined for further implementation. In FY2008, Air Force CPP, in collaboration with Navy CPP, expects to hold serial CPP Technology Interchange Workshops with BAE Systems, Northrop Grumman Corporation, and The Raytheon Company. Each could involve up to 40 SBIR awardees for possible partnerships.

9.2.2 Army SBIR CPP

The objective of the Army SBIR CPP is to increase Army SBIR technology transition and commercialization success to accelerate the fielding of capabilities to soldiers, and to benefit the nation through stimulated tech-

nological innovation, improved manufacturing capability, and increased competition, productivity, and economic growth.

Through a competitive process, the Army selected a U.S.-owned small business, MILCOM Venture Partners, to help manage its CPP. MILCOM provides recommendations to the Army regarding those ongoing SBIR projects that are expected to meet high priority Army requirements and have the potential for rapid transitioning to Phase III and into the acquisition process. Additionally, each project may have the potential for commercial use in the private sector, attracting more private investment to further the development relating to the technology and/or realizing revenue from it.

MILCOM provides CPP participants advice, guidance, analysis and assistance with the preparation of business, marketing and technology transition plans; and assistance with matching SBIR developed Phase II technology with government and/or industry customers. (MILCOM has no financial interests in any ongoing Army SBIR project and maintains an Organizational Conflict of Interest plan with the CPP.)

While the Army CPP strategy precludes financial investment in SBIR small businesses by MILCOM, participating firms receive assistance in how to obtain third-party (non-SBIR) funding to include private sector and/or non-SBIR government funding, sales of the specific technology, and in some cases, possible venture capital investment by other entities if desired by the SBIR awardee. During FY2007, MILCOM reviewed 416 CPP candidates and finally recommended 25 to the Army for possible funding through a special $15M fund to enhance SBC efforts to meet CPP and SBIR objectives.

9.2.3 Navy SBIR CPP

The Navy CPP initiative was strategized to help reformat Navy SBIR practice to maximize the potential for technology transition into Navy systems, through a four-prong strategy:

- Ensure that SBIR topics are focused on Navy priorities and tied to acquisition roadmaps and timelines.
- Realign from a "technology push" to a "requirements pull" approach.
- Involve key transition decision-makers throughout the technology development process.
- Expand transition support both to SBIR firms and Navy program office personnel.

The Navy CPP goal, therefore, is to accelerate and incentivize the transition of SBIR projects into high-priority Navy systems through an enhanced matching process. Launched in FY2006, Navy CPP was modeled to each System Command's needs, and focused on mitigating transition risks. Positive results were reported for FY2006-07, with ~50 SBIR projects participating in Navy CPP by the onset of FY2008.

Navy CPP set forth four objectives to reach its goal:

- Accelerate and/or improve transition of SBIR-funded technologies to Phase III using expert technical, business and financial assistance.
- Enhance connectivity among SBIR firms, large defense contractors and Navy R&D and acquisition communities through clear transition planning.
- Improve SBIR firms' capability to provide technology to DoD military services through a focus on identifying requirements, KPPs and related information.
- Establish success metrics, track and report CPP process actions and results.

Generally, each SYSCOM practices a CPP process of developing a list, continuously refreshed, of SBIR projects proposed for CPP participation, followed by rigorous assessment to ensure that CPP downselect candidates address a priority military requirement, have a well thought-out and properly endorsed Phase III transition plan which specifies the future steps and needed funding amounts and sources. PEOs play a decisive role in these CPP assessments, most of which benefit from a new Phase II "gated funding process" that makes funding available as projects advance through the gates.

Emphasis is placed on adding SBIR and non-SBIR funds to key SBIR projects to mature the technology, preferentially using SBIR funds to incentivize non-SBIR funding matches from either government or industry, or both. The use of content-rich quad charts, and Technology Transition Plans and related agreements, is key to Navy CPP assessments. Emphasis is also placed on providing expert technical and business assistance including, for example, granular technology and manufacturing readiness assessments and needed services to secure certifications.

Navy CPP's annual practice is to disburse to NAVAIR and NAVSEA 100% of CPP funds for direct assistance to their respective CPP projects. Other funds are committed to Navy-wide CPP initiatives, beginning in FY2006 with a special SAT (technology acceleration) fund to incentivize key tran-

sition stream players. As a result, the Navy's FY2006 CPP report noted a total of 32 SBIR Phase II projects advanced as candidates for CPP assistance, exclusive of ~25 SAT candidates—projects supported by Command program offices with the potential to rapidly transition through Phase III into Programs of Record. By the onset of FY2008, ~50 SBIR projects had emerged from candidacy into full CPP participation.

Section 10.0 | SBIR/STTR Marketing by Large Firms

10.1 Federal (Program Office) Marketing to Obtain Phase III Funding

Although the prime contractor interview and survey record shows difficulty in winning Phase III funding for SBIR/STTR projects from special DoD technology transition support funds, as noted above in Sections 5.6 and 6.2, the interview and survey record indicates more success when an SBIR/STTR partnership markets itself directly to an acquisition program office.

Because Navy Programs of Record generally lack detailed technology insertion plans, such as the short-lived DD(X) plan in Block 3 circa 2004, an SBIR/STTR partnership must be marketed to acquisition program offices for visibility and technology acceptance. For three reasons, an SBIR/STTR partnership can be very attractive to an acquisition program office seeking an innovative, cost-effective solution to a technology need: its connotation of "other peoples' money, the possibility of additional SBIR/STTR funds being added to Phase II projects, and potential investment by the larger firm to accelerate technology maturation. Attractiveness is further enhanced if the SBIR/STTR project at issue derives from a topic authored by that program office, and there is a history in the program office of tracking topic awards it has authored.

The prime contractor interview and survey record shows that more effective marketing strategies of SBIR/STTR partnerships begin as early as Phase I, with emphasis on requirement compliance, technology innovation, risk-mitigation strategies, and attention to SBIR/STTR data rights issues (not always understood outside the SBIR/STTR community).

A prospective change in federal reporting policy may incentivize primes to market SBIR/STTR partnerships. While prime contractors are not required to report separately on SBIR/STTR partnering as part of their compliance

with Small Business Administration rules on small business contracting, establishment of such a policy has been part of the discussion on SBIR program reauthorization.

10.2 Industry Marketing for Additional Investment, License or Sale

Claims were made in some prime contractors interviews, especially of business development or engineering executives, that a key criteria in making the decision to partner with an SBIR/STTR awardee is the possibility of multiple technology applications and increased business opportunities with one or more government or industry customers, including foreign defense industry firms. Non-traditional marketing approaches may yield great benefits, and multiple applications, if realized, would significantly increase a large firm's return on its SBIR/STTR partnership investment.

A limited 2008 survey of two mid-size and one large top-tier defense supplier provided some evidence of ability to apply market vertical analysis tools to new technology areas, which could be useful in expanding market share with existing and potential new customers. Although SBIR/STTR technologies had not been assessed with these tools, they are applicable to SBIR/STTR assessment – with good results expected.

Section 11.0 | Dispute Resolution

11.1 SBIR/STTR Dispute Resolution Strategies and Resources

Over the history of the Navy SBIR/STTR program, both large and small firms have taken disputes directly to the Navy SBIR Director or the STTR Program Manager. This is not the preferred approach. Dispute resolution should commence as close to the SBIR/STTR project and project management as possible—with the understanding that government program staff are trained to consult Legal Affairs first, and this office can be slow to respond to such inquiries. The key, therefore, is to anticipate disputes and be proactive in partnerships through clear definition early on of roles and who owns what.

The Navy is a decentralized service with its four large Systems Commands plus the Office of Naval Research (ONR) and a host of smaller organizations. As defense RDT&E budgets have increased annually, SBIR and STTR programs have grown apace to the present Navy combined programs bud-

get of ~$350M, necessitating the establishment of an SBIR/STTR administrative capability at the SYSCOM level and often at the PEO level.

SBIR/STTR project disputes related to SB and large firm partnerships may be approached at any one of five Navy management levels; discussions should be held at the lowest management level possible. The five levels are described below.

11.1.1 Technical Project Manager (TPOC)

With the Navy SBIR/STTR focus on successful transition of its projects, the TPOC plays the most immediate and key role as project monitor for the government. Veteran TPOCs often have acquisition program experience, in addition to their technical skills, and will likely understand contracting/subcontracting issues. While a young, inexperienced TPOC based at a Navy laboratory may struggle with partnering issues, TPOC training modules are increasingly being utilized throughout the SYSCOMS. The main challenge is that virtually all Navy SBIR/STTR TPOCs have another job as their principal tasking. While TPOCs are trained to avoid stepping into legal issues, such as those involving a SBIR/STTR contractual statement of work, a TPOC can play a central coordination role in dispute resolution. It is incumbent that SB and large firm partners take the initiative to interact regularly with SBIR/STTR project TPOCs.

11.1.2 PEO SBIR/STTR Coordinator

Pursuant to SECNAVINST 4380.7B, more and more Program Executive Offices in NAVAIR, NAVSEA and SPAWAR have a full-time SBIR Technology or Transition Manager, often titled "SBIR/STTR Coordinator". In very large PEOs, such as NAVSEA's PEO Ships, these are separate positions with the Coordinator leading projects management. Unlike the TPOC, the PEO SBIR/STTR Coordinator can be expected to have direct links with key personnel in the acquisition program offices within that PEO to facilitate the transition process into POR systems or subsystems. In some NAVAIR and NAVSEA PEOs, the Coordinator role may be filled by the PEO's Technology Director. Large firm partners should interact regularly with PEO SBIR/STTR Coordinators or their surrogates.

11.1.3 SYSCOM/ONR SBIR or STTR Program Managers

The SYSCOM-level SBIR/STTR Administrator can play a decisive role in dispute resolution. In large SYSCOMs such as NAVSEA and NAVAIR, dispute resolution efforts should launch at lower levels whenever pos-

sible. Keeping in mind the Navy's decentralized nature, it's important to note that NAVAIR has a diversified SBIR/STTR staff at the SYSCOM level to work closely with NAVAIR PEOs. Therefore, NAVAIR dispute resolution may commence with key SYSCOM-level staff. In the case of a small SYSCOM such as MARCOR, dispute discussions will best take place at the SYSCOM management level. Large firm partners should know these key SBIR/STTR personnel and interact regularly with them depending on project needs and changes in SYSCOM staffing patterns.

11.1.4 SYSCOM Commercialization Pilot Program (CPP) Manager

If a dispute concerns a Navy CPP candidate or selected project, resolution efforts should commence with the SYSCOM CPP Manager for NAVAIR and NAVSEA or with the Navy-wide CPP Manager for MARCOR, SPAWAR and ONR CPP projects.

11.1.5 Navy SBIR Director and STTR Program Manager –

For STTR disputes, resolution should commence at the Navy-wide level with the STTR Program Manager, except in NAVAIR's case, which has an STTR coordinator at the SYSCOM level. For SBIR disputes, the Navy SBIR Director should be considered as a "court of last resort," as the Director has many other responsibilities in addition to leading Navy SBIR work – and in any case, will first go to the SBIR staff level closest to the project to get dispute information.

11.2 Legal Recourse

While the litigation avenue to SBIR/STTR dispute resolution exists, its cost has often been found to be disproportionate to the benefit of the outcomes.

Section 12.0 | Key SBIR/STTR Points of Contact

12.1 Navy-Wide and SYSCOM SBIR/STTR Program Managers

Office	Name	Address	Phone/Fax
Navy-wide	John Williams	Office of Naval Research One Liberty Center 875 North Randolph Street Code 03TSB, Room 262A Arlington, VA 22203-1995 www.onr.navy.mil/sci_tech/3t/sbir_sttr	Phone: 703-696-0342 Fax: 703-696-4884 Email: john.williams6@navy.mil
Navy-wide	Peter Majumdar	Attn: Deputy Navy SBIR Program Manager Office of Naval Research One Liberty Center 875 North Randolph Street Code 03TSB, Room 259 Arlington, VA 22203-1995 www.onr.navy.mil/sci_tech/3t/sbir_sttr	Phone: 703-696-0445 Fax: 703-696-4884 Email: peter_majumdar@onr.navy.mil
Navy-wide	Steven Sullivan	Attn: Navy STTR Program Manager Office of Naval Research One Liberty Center 875 North Randolph Street Code 03TSB, Room 261 Arlington, VA 22203-1995 www.onr.navy.mil/sci_tech/3t/sbir_sttr www.onr.navy.mil/02/bus_op.htm	Phone: 703-696-7830 Fax: 703-696-4884 Email: steven.sullivan@navy.mil
ONR	Tracy Frost	Attn: ONR SBIR Program Manager Office of Naval Research One Liberty Center 875 North Randolph Street Code 03TSB, Room W262D Arlington, VA 22203-1995 www.onr.navy.mil/sci_tech/3t/sbir_sttr www.onr.navy.mil/02/bus_op.htm	Phone: 703-696-3196 Fax: 703-696-4884 Email: tracy.frost@navy.mil
SPAWAR	Steve Stewart	Space and Naval Warfare Systems Command Attn: Code 05SBIR Building OT-3 4301 Pacific Hwy San Diego, CA 92110-3127 enterprise.spawar.navy.mil/sbir/	Phone: 619-553-2546 Email: steve.stewart@navy.mil

Office	Name	Address	Phone/Fax
MARCOR	Paul A. Lambert	USMC SBIR Program Manager Technology Transition Office (TTO) Marine Corps Systems Command ATTN: SBIR Paul A. Lambert 2200 Lester St. Quantico, VA 22134-5010 www.marcorsyscom.usmc.mil/s&t/ostindex.htm	Phone: 703-432-3502 Fax: 703-432-3322 Email: paul.a.lambert@usmc.navy.mil
NAVAIR	Janet McGovern	NAVSTO 4.0T, Rm N137 48150 Shaw Road, Bldg 2109 Suite N122, Unit #5 Pax River, MD 20670-1907 www.navair.navy.mil/sbir	Phone: 301-342-0215 Fax: 301-757-3258 Email: janet.mcgovern@navy.mil
NAVSEA	Dean Putnam	Naval Sea Systems Command Attn: Code 05DR 1333 Isaac Hull Avenue SE Washington Navy Yard, D.C. 20376-2030 www.navsea.navy.mil	Phone: 202-781-3216 Email: dean.r.putnam@navy.mil
NAVSUP	Bree Anna Hartlage	Naval Supply Systems Command, HQ Command Science Advisor (CSA) 5440 Carlisle Pike Bldg. 309, Rm 113-28 Mechanicsburg, PA 17055 www.navsup.navy.mil	Phone: 717-605-3405 Fax: 717-605-7642 Email: see www.navysbir.com
NAWCWD	Michael Seltzer	Naval Air Warfare Center Weapons Division Code 498400D MS 6312 1900 North Knox Road China Lake, CA 93555-6106 www.nawcwpns.navy.mil	Phone: 760-939-1074 Fax: 760-939-1210 Email: see www.navysbir.com
NAWCAD	Mary Eileen Farrell	Acoustic Technologies Branch Code 4.5.5.4. Bldg 2185 22347 Cedar Point Road Unit 6 Patuxent River, MD 20670-1161 www.nawcad.navy.mil	Phone: 301-342-2114 Fax: 301-342-2098 Email: see www.navysbir.com
NAWCTSD	Thomas Franz	Naval Air Warfare Center/ Training Systems Div. 12350 Research Pkwy, Attn: Code 49T Orlando, FL 32826-3275 www.ntsc.navy.mil	Phone: 407-380-8393 Fax: 407-380-4829 Email: see www.navysbir.com
SPAWARSYSCEN	Larry Flesner	Commanding Officer ATTN: LARRY FLESNER D14 (PL-TS) SPAWARSYSCEN 53560 Hull Street San Diego, CA 92152-5001 www.spawar.navy.mil/sandiego	Phone: 619-553-1044 Fax: 619-553-6924 Email: see www.navysbir.com
NFESC	Nick Olah	Naval Facilities Engineering Service Center ESC 08 Building 1100, 23rd Avenue Port Hueneme, CA 93043-4370 portal.navfac.navy.mil	Phone: 619-553-1044 Fax: 619-553-6924 Email: see www.navysbir.com

Office	Name	Address	Phone/Fax
NAVFAC	Milon Essoglou	Naval Facilities Engineering Command Washington Navy Yard, Suite 1000 1322 Patterson Ave, SE Washington DC 20374-5065 portal.navfac.navy.mil	Phone: 202-685-9362 Fax: 202-685-1569 Email: see www.navysbir.com
NPRDC	Ron Bearden	Navy Personnel Command Navy Personnel Research, Studies & Technology ATTN: PERS-13 (NPRST) 5720 Integraty Drive Millington TN 38055-1300 www.nprdc.navy.mil	Phone: 901-874-2972 Fax: 901-874-2570 Email: see www.navysbir.com
NRL	Michelle Nicholl	Naval Research Laboratory Attn: Code 3210, Bldg. 222, Room 115A Washington, D.C. 20375-5326 www.nrl.navy.mil	Phone: 202-767-6263 Fax: 202-767-5896 Email: see www.navysbir.com
NSWCCARD	James Wood	Naval Surface Warfare Center - Carderock Attn: Code 0120/9500 MacArthur Blvd Bldg. 1, Room 213 West Bethesda, MD 20817-5700 www.dt.navy.mil	Phone: 301-227-2690 Fax: 301-227-2138 Email: see www.navysbir.com
NSWCCSS	Ed Linsenmeyer	Naval Surface Warefare Ctr/Coastal System Station 6703 West Highway 98 Attn: Code R10/Panama City, FL 32407 www.ncsc.navy.mil	Phone: 850-234-4161 Fax: 850-235-5374 Email: see www.navysbir.com
NSWCDD	Cheryl M. Reckeweg	Naval Surface Warfare Center Dahlgren Division NSWCDD C5 6149 Welsh Road Suite 203 Dahlgren VA 22448-5130 www.nswc.navy.mil	Phone: 540-653-2633 Fax: 540-653-8975 Email: see www.navysbir.com
NSWCIH	Nancy C. Johnson	Naval Surface Warfare Center Indian Head Division Code 4440H, Bldg 302 101 Strauss Avenue Indian Head, MD 20640-5035 www.ih.navy.mil	Phone: 301-744-2575 Fax: 301-744-6406 Email: see www.navysbir.com
NUWC	Jack Griffin	Naval Undersea Warfare Center 1176 Howell Street, Bldg. 108 Newport, RI 02841 www.npt.nuwc.navy.mil	Phone: 401-832-7283 Fax: 401-832-1725 Email: see www.navysbir.com
SSP	Charles Marino	Strategic Systems Programs SP-2020, Deputy Technical Plans Office 2521 S Clark Street Suite 1000 Arlington , VA 22202-3930 www.ssp.navy.mil	Phone: 703-601-9166 Email: see www.navysbir.com

12.2 Navy SBIR Commercialization Pilot Program Managers

Office	Name	Address	Phone/Fax
Navy-wide	Lee Ann Boyer	Office of Naval Research One Liberty Center 875 North Randolph Street Code 03TSB, Room 260 Arlington, VA 22203-1995 www.navysbir.com	Phone: 703-696-4841 Fax: 703-696-4884 Email: leeann.boyer@navy.mil
NAVAIR	Kimberly Berche	NAVSTO 4.0T 48150 Shaw Road, Bldg 2109 Suite N122, Unit #5 Pax River, MD 20670-1907 www.navair.navy.mil/sbir	Phone: 301-757-9538 Email: kimberly.berche@navy.mil
NAVSEA	Michelle Willis	EG&G NAVSEA Support 300 M St. SE #400 Washington, D.C. 20003 www.navsea.navy.mil	Phone: 202-781-4182 Email: michelle.e.willis@navy.mil

12.3 Navy SBIR/STTR Staff and Liaisons – Acquisition Program Offices

Major acquisition programs at ACAT 1 and 2 levels within the Department of Defense have designated an individual who is (a) knowledgeable about the technology needs of the acquisition program and (b) responsible for technology infusion into the program, to serve as the program's SBIR/STTR Liaison. These Liaisons interface with the SBIR program managers within DoD and with the SBIR contractor community for the purpose of integrating appropriate SBIR technologies into their acquisition programs. A list of these Liaisons and their contact information may be found at www.navysbir.com under *Points of Contact.*

In addition, an increasing number of Program Executive Offices in NAVSEA, NAVAIR and SPAWAR have a full-time SBIR Technology or Transition Manager, often titled "SBIR/STTR Coordinator". In some very large PEOs such as NAVSEA's PEO Ships, these are separate positions with the Coordinator leading projects management. SBIR/STTR contact information for PEOs is available from SYSCOM SBIR/STTR Program Managers.